

SEQUENCE LISTING



<110> DellaPenna, Dean
Tian, Li
Kim, Joonyul

<120> Novel Carotenoid Hydroxylases for Use in Engineering Carotenoid Metabolism in Plants

<130> MSU-08604

<140> 10/751,235

<141> 2004-01-02

<160> 74

<170> PatentIn version 3.2

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<212> PRT
<213> Arabidopsis thaliana

<400> 15

Phe Ser Gly Gly Pro Arg Lys Cys Val Gly
1 5 10

<210> 16
<211> 561
<212> PRT
<213> Oryza sativa

<400> 16

Met Ala Ala Ala Ala Ala Ala Val Pro Cys Val Pro Phe Leu Cys
1 5 10 15

Pro Pro Pro Pro Pro Leu Val Ser Pro Arg Leu Arg Arg Gly His Val
20 25 30

Arg Leu Arg Leu Arg Pro Pro Arg Ser Ser Gly Gly Gly Gly Gly Gly
35 40 45

Gly Ala Gly Gly Asp Glu Pro Pro Ile Thr Thr Ser Trp Val Ser Pro
50 55 60

Asp Trp Leu Thr Ala Leu Ser Arg Ser Val Ala Thr Arg Leu Gly Gly
 65 70 75 80

Gly Asp Asp Ser Gly Ile Pro Val Ala Ser Ala Lys Leu Asp Asp Val
 85 90 95

Arg Asp Leu Leu Gly Gly Ala Leu Phe Leu Pro Leu Phe Lys Trp Phe
 100 105 110

Arg Glu Glu Gly Pro Val Tyr Arg Leu Ala Ala Gly Pro Arg Asp Leu
 115 120 125

Val Val Val Ser Asp Pro Ala Val Ala Arg His Val Leu Arg Gly Tyr
 130 135 140

Gly Ser Arg Tyr Glu Lys Gly Leu Val Ala Glu Val Ser Glu Phe Leu
 145 150 155 160

Phe Gly Ser Gly Phe Ala Ile Ala Glu Gly Ala Leu Trp Thr Val Arg
 165 170 175

Arg Arg Ser Val Val Pro Ser Leu His Lys Arg Phe Leu Ser Val Met
 180 185 190

Val Asp Arg Val Phe Cys Lys Cys Ala Glu Arg Leu Val Glu Lys Leu
 195 200 205

Glu Thr Ser Ala Leu Ser Gly Lys Pro Val Asn Met Glu Ala Arg Phe
 210 215 220

Ser Gln Met Thr Leu Asp Val Ile Gly Leu Ser Leu Phe Asn Tyr Asn
 225 230 235 240

Phe Asp Ser Leu Thr Ser Asp Ser Pro Val Ile Asp Ala Val Tyr Thr
 245 250 255

Ala Leu Lys Glu Ala Glu Leu Arg Ser Thr Asp Leu Leu Pro Tyr Trp
 260 265 270

Lys Ile Asp Leu Leu Cys Lys Ile Val Pro Arg Gln Ile Lys Ala Glu
 275 280 285

Lys Ala Val Asn Ile Ile Arg Asn Thr Val Glu Asp Leu Ile Thr Lys
 290 295 300

Cys Lys Lys Ile Val Asp Ala Glu Asn Glu Gln Ile Glu Gly Glu Glu
 305 310 315 320

Tyr Val Asn Glu Ala Asp Pro Ser Ile Leu Arg Phe Leu Leu Ala Ser
 325 330 335

Arg Glu Glu Val Thr Ser Val Gln Leu Arg Asp Asp Leu Leu Ser Met
 340 345 350

Leu Val Ala Gly His Glu Thr Thr Gly Ser Val Leu Thr Trp Thr Ile
 355 360 365

Tyr Leu Leu Ser Lys Asp Pro Ala Ala Leu Arg Arg Ala Gln Ala Glu
 370 375 380

Val Asp Arg Val Leu Gln Gly Arg Leu Pro Arg Tyr Glu Asp Leu Lys
 385 390 395 400

Glu Leu Lys Tyr Leu Met Arg Cys Ile Asn Glu Ser Met Arg Leu Tyr
 405 410 415

Pro His Pro Pro Val Leu Ile Arg Arg Ala Ile Val Asp Asp Val Leu
 420 425 430

Pro Gly Asn Tyr Lys Ile Lys Ala Gly Gln Asp Ile Met Ile Ser Val
 435 440 445

Tyr Asn Ile His Arg Ser Pro Glu Val Trp Asp Arg Ala Asp Asp Phe
 450 455 460

Ile Pro Glu Arg Phe Asp Leu Glu Gly Pro Val Pro Asn Glu Thr Asn
 465 470 475 480

Thr Glu Tyr Arg Phe Ile Pro Phe Ser Gly Gly Pro Arg Lys Cys Val
 485 490 495

Gly Asp Gln Phe Ala Leu Leu Glu Ala Ile Val Ala Leu Ala Val Val
 500 505 510

Leu Gln Lys Met Asp Ile Glu Leu Val Pro Asp Gln Lys Ile Asn Met
 515 520 525

Thr Thr Gly Ala Thr Ile His Thr Thr Asn Gly Leu Tyr Met Asn Val
 530 535 540

Ser Leu Arg Lys Val Asp Arg Glu Pro Asp Phe Ala Leu Ser Gly Ser
 545 550 555 560

Arg

<210> 17
 <211> 545
 <212> PRT
 <213> Hordeum vulgare

<220>
 <221> misc_feature
 <222> (529)..(529)
 <223> Xaa can be any naturally occurring amino acid
 <400> 17

Met Pro Ala Ala Ala Phe Ala Ser Ala Leu Ala Ser Pro Pro Pro Pro
 1 5 10 15

Trp Ala Pro Arg Pro Ser Pro Arg His Ala Ser Leu Arg Leu Pro Pro
 20 25 30

Pro Arg Ser Ser Gly Gly Gly Gly Asp Lys Pro Thr Thr Ser Trp Val
 35 40 45

Ser Pro Asp Trp Leu Thr Ser Leu Ser Arg Ser Val Leu Gly Arg Gly
 50 55 60

Asn Asp Asp Ser Gly Ile Pro Val Ala Ser Ala Lys Leu Asp Asp Val
 65 70 75 80

Gln Asp Leu Leu Gly Gly Ala Leu Phe Leu Pro Leu Phe Lys Trp Phe
 85 90 95

Arg Glu Glu Gly Pro Val Tyr Arg Leu Ala Ala Gly Pro Arg Asp Phe
 100 105 110

Val Ile Val Ser Asp Pro Ala Val Ala Lys His Val Leu Arg Gly Tyr
 115 120 125

Gly Thr Arg Tyr Glu Lys Gly Leu Val Ala Glu Val Ser Glu Phe Leu
 130 135 140

Phe Gly Ser Gly Phe Ala Ile Ala Glu Gly Ala Leu Trp Thr Val Arg
145 150 155 160

Arg Arg Ala Val Val Pro Ser Leu His Lys Arg Phe Leu Ser Val Met
165 170 175

Val Asp Lys Val Phe Cys Lys Cys Ala Glu Arg Leu Val Glu Lys Leu
180 185 190

Glu Thr Tyr Ala Leu Ser Gly Glu Pro Val Asn Met Glu Ala Arg Phe
195 200 205

Ser Gln Met Thr Leu Asp Val Ile Gly Leu Ser Leu Phe Asn Tyr Asn
210 215 220

Phe Asp Ser Leu Thr Ser Asp Ser Pro Val Ile Asp Ala Val Tyr Thr
225 230 235 240

Ala Leu Lys Glu Ala Glu Ala Arg Ser Thr Asp Leu Leu Pro Tyr Trp
245 250 255

Gln Ile Asp Leu Leu Cys Lys Ile Val Pro Arg Gln Ile Lys Ala Glu
260 265 270

Lys Ala Val Asn Thr Ile Arg Asn Thr Val Glu Glu Leu Ile Ile Lys
275 280 285

Cys Lys Ala Ile Val Asp Ala Glu Asn Glu Gln Ile Glu Gly Glu Glu
290 295 300

Tyr Val Asn Glu Ala Asp Pro Ser Ile Leu Arg Phe Leu Leu Ala Ser
305 310 315 320

Arg Glu Glu Val Ser Ser Leu Gln Leu Arg Asp Asp Leu Leu Ser Met
325 330 335

Leu Val Ala Gly His Glu Thr Thr Gly Ser Val Leu Thr Trp Thr Ile
340 345 350

Tyr Leu Leu Ser Lys Asp Pro Val Ala Leu Arg Arg Ala Gln Asp Glu
355 360 365

Val Asp Arg Val Leu Gln Gly Arg Leu Pro Arg Tyr Glu Asp Val Lys
370 375 380

Glu Leu Lys Tyr Leu Met Arg Cys Ile Asn Glu Ser Met Arg Leu Tyr
385 390 395 400

Pro His Pro Pro Val Leu Ile Arg Arg Ala Leu Val Asp Asp Val Leu
405 410 415

Pro Gly Asn Tyr Lys Val Lys Thr Gly Gln Asp Ile Met Ile Ser Val
420 425 430

Tyr Asn Ile His Arg Ser Pro Glu Val Trp Asp Arg Ala Asp Glu Phe
435 440 445

Ile Pro Glu Arg Phe Asp Leu Glu Gly Pro Ile Pro Asn Glu Ser Asn
450 455 460

Thr Asp Phe Arg Phe Ile Pro Phe Ser Gly Gly Pro Arg Lys Cys Val
465 470 475 480

Gly Asp Gln Phe Ala Leu Leu Glu Ala Ile Val Ala Leu Ala Ile Val
485 490 495

Ile Gln Lys Met Asp Val Gln Leu Val Ala Asp Gln Lys Ile Ser Met
500 505 510

Thr Thr Gly Ala Thr Ile His Thr Thr Asn Gly Leu Tyr Met Asn Val
515 520 525

Xaa Leu Arg Lys Val Glu Gln Glu Ala Asp Leu Ala Leu Ser Pro Ser
530 535 540

Gly
545

<210> 18
<211> 362
<212> PRT
<213> Triticum aestivum

<400> 18

Met Pro Ala Ala Ala Phe Ala Ser Ala Phe Ala Ser Pro Pro Pro Pro
1 5 10 15

Trp Ala Pro Arg Pro Pro Pro Arg His Ala Ser Leu Arg Leu Pro Pro
20 25 30

Pro Arg Ser Ser Ser Asn Asn Ser Gly Gly Gly Gly Gly Asp Lys Pro
35 40 45

Thr Thr Ser Trp Val Ser Pro Asp Trp Leu Thr Ser Leu Ser Arg Ser
50 55 60

Val Leu Gly Arg Gly Asn Asp Asp Ser Gly Ile Pro Val Ala Ser Ala
 65 70 75 80

Lys Leu Asp Asp Val Gln Asp Leu Leu Gly Gly Ala Leu Phe Leu Pro
 85 90 95

Leu Phe Lys Trp Phe Arg Glu Glu Gly Pro Val Tyr Arg Leu Ala Ala
 100 105 110

Gly Pro Arg Asp Phe Val Ile Val Ser Asp Pro Ala Val Ala Lys His
 115 120 125

Val Leu Arg Gly Tyr Gly Thr Arg Tyr Glu Lys Gly Leu Val Ala Glu
 130 135 140

Val Ser Glu Phe Leu Phe Gly Ser Gly Phe Ala Ile Ala Glu Gly Ala
 145 150 155 160

Leu Trp Thr Val Arg Arg Arg Ala Val Val Pro Ser Leu His Lys Arg
 165 170 175

Phe Leu Ser Val Met Val Asp Lys Val Phe Cys Lys Cys Ala Glu Arg
 180 185 190

Leu Val Glu Lys Leu Glu Thr Tyr Ala Leu Ser Gly Glu Pro Val Asn
 195 200 205

Met Glu Ala Arg Phe Ser Gln Met Thr Leu Asp Val Ile Gly Leu Ser
 210 215 220

Leu Phe Asn Tyr Asn Phe Asp Ser Leu Thr Ser Asp Ser Pro Val Ile
 225 230 235 240

Asp Ala Val Tyr Thr Ala Leu Lys Glu Ala Glu Ala Arg Ser Thr Asp
 245 250 255

Leu Leu Pro Tyr Trp Gln Ile Asp Leu Leu Cys Lys Ile Val Pro Arg
 260 265 270

Gln Ile Lys Ala Glu Lys Ala Val Asn Thr Ile Arg Asn Thr Val Glu
 275 280 285

Glu Leu Ile Thr Lys Cys Lys Ala Ile Val Asp Ala Glu Asn Glu Gln
 290 295 300

Ile Glu Gly Glu Glu Tyr Val Asn Glu Ala Asp Pro Ser Ile Leu Arg
 305 310 315 320

Phe Leu Leu Ala Ser Arg Glu Glu Val Ser Ser Leu Gln Leu Arg Asp
 325 330 335

Asp Leu Leu Ser Met Leu Val Ala Gly His Glu Thr Thr Gly Ser Val
 340 345 350

Pro Asp Tyr Arg Leu Gln Ala Gln Gly Ser
 355 360

<210> 19
 <211> 279
 <212> PRT
 <213> Lycopersicon esculentum
 <400> 19

Cys Arg Cys Ala Glu Arg Met Val Glu Lys Leu Leu Pro Asp Ala Ile
 1 5 10 15

Ser Gly Ser Ala Val Asn Met Glu Ala Lys Phe Ser Gln Leu Thr Leu
 20 25 30

Asp Val Ile Gly Leu Ala Leu Phe Asn Tyr Asn Phe Asp Ser Leu Thr
 35 40 45

Thr Asp Ser Pro Val Ile Asp Ala Val Tyr Thr Ala Leu Lys Glu Ala
 50 55 60

Glu Leu Arg Ser Thr Asp Leu Leu Pro Tyr Trp Gln Ile Lys Ala Leu
 65 70 75 80

Cys Lys Phe Ile Pro Arg Gln Ile Lys Ala Glu Asn Ala Val Ser Leu
 85 90 95

Ile Arg Gln Thr Val Glu Glu Leu Ile Ala Lys Cys Arg Glu Ile Val
 100 105 110

Glu Thr Glu Gly Glu Arg Ile Asn Glu Asp Glu Tyr Val Asn Asp Arg
 115 120 125

Asp Pro Ser Ile Leu Arg Phe Leu Leu Ala Ser Arg Glu Glu Val Ser
 130 135 140

Ser Leu Gln Leu Arg Asp Asp Leu Leu Ser Met Leu Val Ala Gly His
 145 150 155 160

Glu Thr Thr Gly Ser Val Leu Thr Trp Thr Ala Tyr Leu Leu Ser Lys
165 170 175

Asp Pro Ser Ser Leu Glu Lys Ala His Glu Glu Val Asp Arg Val Leu
180 185 190

Gly Gly Arg Ser Pro Thr Tyr Glu Asp Met Lys Asn Leu Lys Phe Leu
195 200 205

Thr Arg Cys Ile Thr Glu Ser Leu Arg Leu Tyr Pro His Pro Pro Val
210 215 220

Leu Ile Arg Arg Ala Gln Val Ala Asp Val Leu Pro Gly Asn Tyr Lys
225 230 235 240

Val Asn Val Gly Gln Asp Ile Met Ile Ser Val Tyr Asn Ile His His
245 250 255

Ser Ser Lys Val Trp Asp Arg Ala Glu Glu Phe Asp Pro Glu Arg Phe
260 265 270

Asp Leu Glu Arg Ser Arg Pro
275

<210> 20
<211> 177
<212> PRT
<213> Zea mays

<400> 20

Leu Glu Pro Tyr Ala Leu Ser Gly Glu Pro Val Asn Met Glu Ala Arg
1 5 10 15

Phe Ser Gln Leu Thr Leu Asp Val Ile Gly Leu Ser Leu Phe Asn Tyr
20 25 30

Asn Phe Asp Ser Leu Thr Thr Asp Ser Pro Val Ile Asp Ala Val Tyr
35 40 45

Thr Ala Leu Lys Glu Ala Glu Leu Arg Ser Thr Asp Leu Leu Pro Tyr
50 55 60

Trp Lys Val Gly Phe Leu Cys Lys Ile Ile Pro Arg Gln Ile Lys Ala
65 70 75 80

Glu Asn Ala Val Thr Ile Ile Arg Asn Thr Val Glu Glu Leu Ile Met
85 90 95

Lys Cys Lys Glu Ile Val Glu Ala Glu Asn Glu Gln Ile Glu Gly Glu
100 105 110

Glu Tyr Val Asn Glu Gly Asp Pro Ser Ile Leu Arg Phe Leu Leu Ala
115 120 125

Ser Arg Asp Glu Val Ser Ser Val Gln Leu Arg Asp Asp Leu Leu Ser
130 135 140

Met Leu Val Ala Gly His Glu Thr Thr Gly Ser Val Leu Thr Trp Thr
145 150 155 160

Ile Tyr Leu Leu Ser Lys Asp Pro Thr Ala Leu Arg Arg Ala Gln Asp
165 170 175

Glu

<210> 21
<211> 208
<212> PRT
<213> Helianthus annuus

<400> 21

Gly Pro Arg Asn Phe Val Ile Val Ser Asp Pro Glu Ile Ala Lys His
1 5 10 15

Val Leu Arg Asn Tyr Gly Ser Ile Tyr Ala Lys Gly Leu Val Ala Glu
20 25 30

Val Ser Glu Phe Leu Phe Gly Ser Gly Phe Ala Ile Ala Glu Gly Ser
35 40 45

Leu Trp Thr Ala Arg Arg Arg Ala Val Val Pro Ser Leu His Lys Lys
50 55 60

Tyr Leu Ser Val Ile Val Asp Arg Val Phe Cys Lys Cys Ser Glu Arg
65 70 75 80

Leu Val Glu Lys Leu Arg Ser Tyr Ala Arg Ser Asp Thr Ser Val Asn
85 90 95

Met Glu Gln Gln Phe Ser Gln Leu Thr Leu Asp Val Ile Gly Leu Ala
100 105 110

Val Phe Asn Tyr Asn Phe Asp Ser Leu Thr Ala Asp Ser Pro Val Ile
115 120 125

Glu Ser Val Tyr Thr Ala Leu Lys Glu Ala Glu Ala Arg Ser Thr Asp
 130 135 140

Leu Leu Pro Tyr Trp Lys Ile Ser Ala Leu Cys Lys Ile Ile Pro Arg
 145 150 155 160

Gln Ile Lys Ala Glu Gln Ala Val Thr Val Ile Arg Glu Thr Val Glu
 165 170 175

Glu Leu Ile Ile Lys Cys Lys Glu Ile Val Glu Lys Glu Gly Glu Lys
 180 185 190

Ile Asp Asp Glu Asp Tyr Val Asn Asp Ala Thr Tyr Ile Phe Ile Cys
 195 200 205

<210> 22
 <211> 1686
 <212> DNA
 <213> Oryza sativa

<400> 22
 atggccgccc ccgccgccgc cgccgtcccc tgcgtacat tctgtgccc gcctcctccg 60
 ccattggtct cgccgctct ccgccgtggc cacgtccgcc tccgcctgcg gccgccaagg 120
 agcagcggcg gtggaggcgg aggcggagcg gggggagacg agccgcccac caccacctcg 180
 tgggtgagcc ccgactggct cacggcgctc tcccgctcgg tggcaaccgg cctcggcggg 240
 ggcgacgact cggggatccc cgtcgcctcc gccaaagctcg acgacgtgcg ggacctctc 300
 ggcggcgcg ctttctctcc tctcttcaag tggttccgcg aggaaggccc cgtctaccgc 360
 ctgcgcggcg ggccgcggga tctcgtcgtc gtcagcgatc ccgccgttgc caggcacgtg 420
 ctgcgtgggt acggttcgag gtacgagaag gggctcgtcg ccgaggtttc cgagttctc 480
 ttcggctccg ggttcgccat cgccgagggc gctctctgga cggtgagacg tcgatcagtt 540
 gtaccatctc tacacaaacg atttctctcg gtgatggttg acagagtttt ttgtaaattg 600
 gctgagagat tagtggagaa gcttgagaca tctgctttaa gtggcaaacc tgtaaatatg 660
 gaagcaaggc tctctcaaat gacttttagat gtgattgggt tgtccttggt caattacaat 720
 tttgattccc tcacatcaga tagccctggt attgatgctg ttacactgc actcaaggaa 780
 gcagaacttc gttctacaga tcttttacca tactggaaga ttgatttgct gtgcaagatt 840
 gttcctagac aaataaaaagc agaaaaggca gttaacatca tcaggaatac cgttgaggac 900
 ctaattacca aatgcaagaa gattgtagat gctgagaatg aacaaattga gggtgaggaa 960
 tatgtaaattg aggcagaccc tagcatcctg cgattcctac ttgctagccg tgaagaggta 1020
 accagtgtgc agttacgtga tgatctattg tcaatgtagg ttgctgggtca tgaaacaaca 1080

ggctctgtac tgacgtggac tatttatctt ctcagtaagg atccagcagc gctgaggaga	1140
gctcaagcag aggttgaccg tgttctacaa ggtagactcc ccagatatga agatctaaaa	1200
gagctgaagt acttgatgcg ctgtataaat gagtctatgc ggctttatcc acaccacct	1260
gtgttgatac ggcgagccat agttgatgat gtgcttcccg gaaactataa gatcaaagct	1320
ggccaagata ttatgatttc agtgtacaat atacacaggt cacctgaggt ttgggacaga	1380
gctgatgatt ttattcctga gagatttgat ttagagggac ctgttccaaa tgagacaaac	1440
actgaataca gatttatccc attcagtgga ggtcctcgga aatgtgttg agatcagttt	1500
gctctcttgg aagcaattgt ggcacttgct gttgtgttgc agaagatgga cattgagctt	1560
gtgccagatc aaaaaattaa catgactact ggggccacaa ttcatacaac caatggcctg	1620
tatatgaatg taagtctgcg taaagttgac agggaacctg attttgcact cagtgggtcc	1680
agatga	1686

<210> 23
 <211> 1638
 <212> DNA
 <213> Hordeum vulgare

<220>
 <221> misc feature
 <222> (1587)..(1587)
 <223> n is a, c, g, or t

<400> 23	
atgcccgcg cggcattcgc ctccgcgctc gcgtctcctc ctccctccatg ggccccacga	60
ccgtccctc ggacgctag cctccgcctg ccccgccaa ggagcagcgg cggcggaggg	120
gacaagccca ccacgtcgtg ggtcagcccc gactggctca cgtcgtctgc ccgctcgggtg	180
ctcggccggg gaaacgacga ctcggggatc cccgtcgcct ccgccaagct cgacgacgtg	240
caggacctcc tcggggggcgc gctcttcctc ccgtcttca agtggttccg cgaggaaggg	300
cccgtctacc gcctcgccgc ggggcccgc gacttcgtca tcgtcagcga ccccgccgtg	360
gccaagcacg tcctccgcgg gtacggcacg cggtagcaga aggggctcgt cgccgaggtc	420
tccgagttcc tctttggctc tgggttcgcc atcgccgagg gagcgctctg gacggtgaga	480
cgtagagcag ttgtaccatc tctacacaaa agatttctct cagtaatggt tgataaagtg	540
ttttgtaa atgtgctgagag attggtggaa aagctcgaga catatgcttt gagcggtgaa	600
cctgttaata tggaagcgag attttctcaa atgacactag atgtgattgg tttgtctttg	660
ttcaactaca actttgattc cctcacatca gatagtcctg ttattgatgc tgtttacacc	720
gcactgaaag aagcagaggc tcgttctaca gatcttttac catactggca gattgatttg	780
ctgtgcaaga ttgttcctag acagatcaaa gcagaaaagg cagttaacac aataaggaat	840

actgttgaag agctaattat aaaatgcaag gcaatcgtag atgctgaaaa tgaacagatt	900
gaggggtgaag aatatgtaaa tgaggcagat cctagcatcc tgcgtttttt acttgctagc	960
cgtgaagagg tcagcagttt gcagttacgt gatgatctat tgtcaatgtt agttgctggg	1020
cacgaaacaa caggctctgt actgacatgg actattttatc ttctcagtaa ggatccagta	1080
gcactaagga gagcccaaga tgaggtagat cgtgttctac aaggtagact cccaagatat	1140
gaagatgtaa aagagctgaa gtacttgatg cgctgtatca atgagtccat gcggctatac	1200
ccacatcctc ctgtgctgat acggcgtgca ctagttgatg atgtgcttcc tggaaactac	1260
aagggttaaga ctggtcaaga tattatgatt tctgtgtaca atattcacag atcacctgag	1320
gtatgggaca gagcagatga attcattcca gagagatttg atttgagggg tcccattcca	1380
aatgagtcaa acaccgattt cagggtttatc cttttcagtg gaggtcctcg aaaatgtggt	1440
ggagatcagt ttgctctttt agaagcaatt gtggcacttg caattgtcat aaaaaagatg	1500
gacgttcagc ttgtggcaga tcaaaaaatc agcatgacca ctggggccac catccataca	1560
accaatggac tgtacatgaa tgtaagnctg cgtaaagttg agcaagaagc tgacttagca	1620
ctgagtccat caggctag	1638

<210> 24
 <211> 1086
 <212> DNA
 <213> Triticum aestivum

<400> 24	
atgcccgcgc cggcattcgc ctccgcgttc gcgtctcctc ctccctccgtg ggccccacga	60
ccgcctcctc gccacgccag cctccgcctg cccccgcaa ggagcagcag caacaacagc	120
ggcggcgggc gaggggacaa gccaccacc tcgtgggtca gcccgcactg gctgacgtcg	180
ctgtctcgct cggtgctcgg ccgggggaac gacgactcgg ggatacccggt cgcctccgcc	240
aagctcgacg acgtgcagga cctcctcggg ggcgcgctct tcctgccgct cttcaagtgg	300
ttccgcgagg aaggggccgt ctaccgcctc gccgcggggc cgcgcgactt cgtcatcgtc	360
agcgaccccg ccgtagccaa gcacgtcctc cgcggttacg gcacgcggta cgagaagggg	420
ctcgtcgccg aggtctccga gttcctcttt ggctctgggt tcgccatcgc cgagggagcg	480
ctctggacgg tgagacgtag agcagttgta ccatctctac aaaaaagatt tctctcagta	540
atggtcgata aagtgttctg taaatgtgct gagagattgg tggaaaagct cgagacttat	600
gctttgagtg gtgaacctgt taatatggaa gcgaggtttt ctcaaagac attagatgtg	660
attggtttat ccttgttcaa ctacaacttt gattccctca catcagatag tcctgttatt	720
gatgctgttt aactgcact caaagaagct gaggtcgtt ctacagatct ttaccatac	780
tggcagatcg atttgctgtg caagattgtt cctagacaga taaaagcgga aaaagcagtt	840

aacacaataa ggaataccgt tgaagagcta attacaaaat gcaaggcaat cgtagatgct	900
gaaaatgaac agattgaggg tgaagaatat gtaaatgagg cagatcctag catcctgcgg	960
tttttacttg ctagccgtga agaggtcagc agtttgagcgt tacgtgatga tctattgtca	1020
atgttagttg ctgggtcatga aacaacaggt tctgtaccag actatcgatt acaagcccaa	1080
ggttcc	1086

<210> 25
 <211> 839
 <212> DNA
 <213> *Lycopersicon esculentum*

<400> 25	
tgcagatgtg ctgagagaat ggtggagaaa cttttacctg atgcaatttc tggctctgca	60
gtgaatatgg aggcaaagtt ttctcaacta acacttgatg ttattggcct tgcactcttc	120
aattacaatt ttgattccct tactactgac agtccagtta ttgatgcagt ttacactgca	180
ctaaaagaag cagaactccg ttcaactgat ttgttgccat attggcagat caaagcttta	240
tgtaagttca tcccacgaca aataaaggct gagaatgcag tgtcattaat cagacaaaca	300
gttgaagaac ttattgcgaa gtgcagagag attgtagaaa ctgaggggtga gaggattaat	360
gaagatgagt acgtgaatga tagagatcca agcatccttc gatttttgct tgctagccgt	420
gaggaggttt caagtttaca acttcgagat gatcttctgt caatgctagt tgctgggcat	480
gaaaccacag gttcagtttt gacttggacg gcatacctgc tgagtaagga cccttcctct	540
ttggaaaaag cacatgagga agtagacaga gttttgggag gacgctctcc gacttatgaa	600
gatatgaaga atctcaagtt cttaacacgg tgcataactg agtcactcag actctatcca	660
catccacctg tcctgataag acgagctcaa gtagctgatg tcctccccgg gaattacaaa	720
gtcaatgttg gtcaggatat aatgatttcg gtatataaca ttcattcttc ttcaaaagta	780
tgggatagag ctgaagaatt tgatcctgaa agattcgact tggaaaggtc ccgtcccaa	839

<210> 26
 <211> 531
 <212> DNA
 <213> *Zea mays*

<400> 26	
cttgagccat atgctttgag tggggaacct gtcaatatgg aagcgagggt ttctcagttg	60
acattggatg tgattggttt atcattgttc aactacaatt ttgattccct cacaacagat	120
agtctgtca ttgatgctgt ttatactgca ctcaaagaag cagagcttcg ttctacagat	180
cttttgccat actggaagggt tggtttcttg tgcaagataa tccaagaca gataaaagca	240
gagaatgcgg ttacgattat aaggaacact gttgaagagc tgattatgaa gtgtaaagaa	300

atagtggaag ctgaaaatga acagattgag ggtgaggaat atgtaaacga aggggatcct	360
agcattctac gcttcctact tgctagccga gatgaggtaa gcagtgtaca attacgtgat	420
gatctcttgt caatgttagt tgctgggtcat gaaacaacag gctctgtact gacgtggaca	480
atctatcttc tcagtaagga tccgactgca ctgaggagag ctcaagatga a	531

<210> 27
 <211> 624
 <212> DNA
 <213> *Helianthus annuus*

<400> 27	
gggccaagaa actttgtgat tgtgagtac cgggagattg ctaagcatgt gttgaggaat	60
tatgggagta tttatgctaa aggccttggt gctgaggctt ctgagttctt gtttggttct	120
ggttttgcca ttgctgaagg ctctctttgg actgcaaggc gcagggctgt agttccatca	180
cttcacaaga agtacttatt agtaatagtt gatcgtgtat ttgcaaattg ctccgagagg	240
cttgctgaaa agctaagatc atacgcacgc agtgacacgt ctgttaacat ggagcaacag	300
ttttcgcagt taacccttga tggtatcggc ctagccgtat ttaactacaa ttttgactca	360
cttacggccg atagtcctgt aattgaatct gtttataccg cactaaaaga agctgaagcc	420
cgttcaactg atcttttgcc atattggaag ataagtgcgt tatgtaagat tataccaaga	480
caaataaaaag ccgagcaagc agttactgta attagagaaa ctgtcgaaga acttattata	540
aaatgcaagg aaatcgttga aaaggaagg gaaaaaatag acgatgaaga ttacgtaaat	600
gatgcaacct atatcttcat ctgc	624

<210> 28
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 28	
cttcctcttc ttactcttct ctcttcact	29

<210> 29
 <211> 29
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 29	
aagaacgatg gatgttatag actgaaatc	29

<210> 30
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 30
 ccgtctcgct gctggtcctc g 21

<210> 31
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 31
 ggatgaatga gtacggaccc at 22

<210> 32
 <211> 21
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Synthetic

<400> 32
 gggtcgctca caattacgaa a 21

<210> 33
 <211> 595
 <212> PRT
 <213> Arabidopsis thaliana

<400> 33

Met Ala Met Ala Phe Pro Leu Ser Tyr Thr Pro Thr Ile Thr Val Lys
 1 5 10 15

Pro Val Thr Tyr Ser Arg Arg Ser Asn Phe Val Val Phe Ser Ser Ser
 20 25 30

Ser Asn Gly Arg Asp Pro Leu Glu Glu Asn Ser Val Pro Asn Gly Val
 35 40 45

Lys Ser Leu Glu Lys Leu Gln Glu Glu Lys Arg Arg Ala Glu Leu Ser
 50 55 60

Ala Arg Ile Ala Ser Gly Ala Phe Thr Val Arg Lys Ser Ser Phe Pro
 65 70 75 80

Ser Thr Val Lys Asn Gly Leu Ser Lys Ile Gly Ile Pro Ser Asn Val
 85 90 95

Leu Asp Phe Met Phe Asp Trp Thr Gly Ser Asp Gln Asp Tyr Pro Lys
 100 105 110

Val Pro Glu Ala Lys Gly Ser Ile Gln Ala Val Arg Asn Glu Ala Phe
 115 120 125

Phe Ile Pro Leu Tyr Glu Leu Phe Leu Thr Tyr Gly Gly Ile Phe Arg
 130 135 140

Leu Thr Phe Gly Pro Lys Ser Phe Leu Ile Val Ser Asp Pro Ser Ile
 145 150 155 160

Ala Lys His Ile Leu Lys Asp Asn Ala Lys Ala Tyr Ser Lys Gly Ile
 165 170 175

Leu Ala Glu Ile Leu Asp Phe Val Met Gly Lys Gly Leu Ile Pro Ala
 180 185 190

Asp Gly Glu Ile Trp Arg Arg Arg Arg Ala Ile Val Pro Ala Leu
 195 200 205

His Gln Lys Tyr Val Ala Ala Met Ile Ser Leu Phe Gly Glu Ala Ser
 210 215 220

Asp Arg Leu Cys Gln Lys Leu Asp Ala Ala Ala Leu Lys Gly Glu Glu
 225 230 235 240

Val Glu Met Glu Ser Leu Phe Ser Arg Leu Thr Leu Asp Ile Ile Gly
 245 250 255

Lys Ala Val Phe Asn Tyr Asp Phe Asp Ser Leu Thr Asn Asp Thr Gly
 260 265 270

Val Ile Glu Ala Val Tyr Thr Val Leu Arg Glu Ala Glu Asp Arg Ser
 275 280 285

Val Ser Pro Ile Pro Val Trp Asp Ile Pro Ile Trp Lys Asp Ile Ser
 290 295 300

Pro Arg Gln Arg Lys Val Ala Thr Ser Leu Lys Leu Ile Asn Asp Thr
 305 310 315 320

Leu Asp Asp Leu Ile Ala Thr Cys Lys Arg Met Val Glu Glu Glu Glu
 325 330 335

Leu Gln Phe His Glu Glu Tyr Met Asn Glu Arg Asp Pro Ser Ile Leu
340 345 350

His Phe Leu Leu Ala Ser Gly Asp Asp Val Ser Ser Lys Gln Leu Arg
355 360 365

Asp Asp Leu Met Thr Met Leu Ile Ala Gly His Glu Thr Ser Ala Ala
370 375 380

Val Leu Thr Trp Thr Phe Tyr Leu Leu Thr Thr Glu Pro Ser Val Val
385 390 395 400

Ala Lys Leu Gln Glu Glu Val Asp Ser Val Ile Gly Asp Arg Phe Pro
405 410 415

Thr Ile Gln Asp Met Lys Lys Leu Lys Tyr Thr Thr Arg Val Met Asn
420 425 430

Glu Ser Leu Arg Leu Tyr Pro Gln Pro Pro Val Leu Ile Arg Arg Ser
435 440 445

Ile Asp Asn Asp Ile Leu Gly Glu Tyr Pro Ile Lys Arg Gly Glu Asp
450 455 460

Ile Phe Ile Ser Val Trp Asn Leu His Arg Ser Pro Leu His Trp Asp
465 470 475 480

Asp Ala Glu Lys Phe Asn Pro Glu Arg Trp Pro Leu Asp Gly Pro Asn
485 490 495

Pro Asn Glu Thr Asn Gln Asn Phe Ser Tyr Leu Pro Phe Gly Gly Gly
500 505 510

Pro Arg Lys Cys Ile Gly Asp Met Phe Ala Ser Phe Glu Asn Val Val
515 520 525

Ala Ile Ala Met Leu Ile Arg Arg Phe Asn Phe Gln Ile Ala Pro Gly
530 535 540

Ala Pro Pro Val Lys Met Thr Thr Gly Ala Thr Ile His Thr Thr Glu
545 550 555 560

Gly Leu Lys Leu Thr Val Thr Lys Arg Thr Lys Pro Leu Asp Ile Pro
565 570 575

Ser Val Pro Ile Leu Pro Met Asp Thr Ser Arg Asp Glu Val Ser Ser
580 585 590

Ala Leu Ser
595

<210> 34
<211> 632
<212> PRT
<213> Oryza sativa

<400> 34

Met Ala Ala Thr Ser Ser Ala Ala Ala Ala Ala Pro Pro Pro Cys Arg
1 5 10 15

Leu Leu Gly Ser Gly Gln Ala His Leu Arg Leu Pro Pro Ser Ala Ala
20 25 30

Ala Ala Ala Ala Ser Ala Arg Arg Arg Leu Leu Leu Arg Cys Ala Ala
35 40 45

Ser Gly Gly Asn Gly Lys Gly Gly Gly Gly Asp Gly Ser Gly Ser Asp
50 55 60

Pro Val Leu Glu Glu Arg Arg Arg Arg Arg Gln Ala Glu Leu Ala Ala
65 70 75 80

Arg Ile Ala Ser Gly Glu Phe Thr Ala Gln Gly Pro Ala Trp Ile Ala
85 90 95

Pro Leu Ala Val Gly Leu Ala Lys Leu Gly Pro Pro Gly Glu Leu Ala
100 105 110

Ala Ala Leu Leu Thr Lys Val Ala Gly Gly Gly Gly Pro Glu Ile Pro
115 120 125

Gln Ala Val Gly Ser Met Ser Ala Val Thr Gly Gln Ala Phe Phe Ile
130 135 140

Pro Leu Tyr Asp Leu Phe Leu Thr Tyr Gly Gly Ile Phe Arg Leu Asn
145 150 155 160

Phe Gly Pro Lys Ser Phe Leu Ile Val Ser Asp Pro Ala Ile Ala Lys
165 170 175

His Ile Leu Arg Asp Asn Ser Lys Ala Tyr Ser Lys Gly Ile Leu Ala
 180 185 190

Glu Ile Leu Glu Phe Val Met Gly Thr Gly Leu Ile Pro Ala Asp Gly
 195 200 205

Glu Ile Trp Arg Val Arg Arg Arg Ala Ile Val Pro Ala Met His Gln
 210 215 220

Lys Tyr Val Thr Ala Met Ile Ser Leu Phe Gly Tyr Ala Ser Asp Arg
 225 230 235 240

Leu Cys Gln Lys Leu Asp Lys Ala Ala Thr Asp Gly Glu Asp Val Glu
 245 250 255

Met Glu Ser Leu Phe Ser Arg Leu Thr Leu Asp Val Ile Gly Lys Ala
 260 265 270

Val Phe Asn Tyr Asp Phe Asp Ser Leu Ser Tyr Asp Asn Gly Ile Val
 275 280 285

Glu Ala Val Tyr Val Thr Leu Arg Glu Ala Glu Met Arg Ser Thr Ser
 290 295 300

Pro Ile Pro Thr Trp Glu Ile Pro Ile Trp Lys Asp Ile Ser Pro Arg
 305 310 315 320

Gln Lys Lys Val Asn Glu Ala Leu Ala Leu Ile Asn Lys Thr Leu Asp
 325 330 335

Glu Leu Ile Asp Ile Cys Lys Arg Leu Val Glu Glu Glu Asp Leu Gln
 340 345 350

Phe His Glu Glu Tyr Met Asn Glu Gln Asp Pro Ser Ile Leu His Phe
 355 360 365

Leu Leu Ala Ser Gly Asp Asp Val Ser Ser Lys Gln Leu Arg Asp Asp
 370 375 380

Leu Met Thr Met Leu Ile Ala Gly His Glu Thr Ser Ala Ala Val Leu
 385 390 395 400

Thr Trp Thr Phe Tyr Leu Leu Ser Lys Tyr Pro Asn Val Met Ala Lys
 405 410 415

Leu Gln Asp Glu Ala Asp Thr Val Leu Gly Asp Arg Leu Pro Thr Ile
 420 425 430

Glu Asp Val Lys Lys Leu Lys Tyr Thr Thr Arg Val Ile Asn Glu Ser
435 440 445

Leu Arg Leu Tyr Pro Gln Pro Pro Val Leu Ile Arg Arg Ser Ile Glu
450 455 460

Glu Asp Met Leu Gly Gly Tyr Pro Ile Gly Arg Gly Glu Asp Ile Phe
465 470 475 480

Ile Ser Val Trp Asn Leu His His Cys Pro Lys His Trp Asp Gly Ala
485 490 495

Asp Val Phe Asn Pro Glu Arg Trp Pro Leu Asp Gly Pro Asn Pro Asn
500 505 510

Glu Thr Asn Gln Asn Phe Ser Tyr Leu Pro Phe Gly Gly Gly Pro Arg
515 520 525

Lys Cys Val Gly Asp Met Phe Ala Thr Phe Glu Thr Val Val Ala Thr
530 535 540

Ala Met Leu Val Arg Arg Phe Asp Phe Gln Met Ala Pro Gly Ala Pro
545 550 555 560

Pro Val Glu Met Thr Thr Gly Ala Thr Ile His Thr Thr Glu Gly Leu
565 570 575

Lys Met Thr Val Thr Arg Arg Thr Lys Pro Pro Val Ile Pro Asn Leu
580 585 590

Glu Met Lys Val Ile Ser Asp Ser Pro Glu Asn Met Ser Thr Thr Thr
595 600 605

Ser Met Pro Val Ser Ala Ala Ser Ile Ala Ser Gly Glu Asp Gln Gln
610 615 620

Gly Gln Val Ser Ala Thr Arg Ile
625 630

<210> 35
 <211> 508
 <212> PRT
 <213> Hordeum vulgare

<400> 35

Ser Ala Arg Gly Gln Ala Val Gly Ser Leu Ala Ser Val Ala Gly Glu
 1 5 10 15

Ala Phe Phe Leu Pro Leu Tyr Asp Leu Phe Leu Thr Tyr Gly Gly Val
 20 25 30

Phe Arg Leu Asn Phe Gly Pro Lys Ser Phe Leu Ile Val Ser Asp Pro
 35 40 45

Asp Val Ala Lys His Ile Leu Arg Asp Asn Ser Lys Ala Tyr Ser Lys
 50 55 60

Gly Ile Leu Ala Glu Ile Leu Glu Phe Val Met Gly Thr Gly Leu Ile
 65 70 75 80

Pro Ala Asp Gly Glu Val Trp Arg Val Arg Arg Arg Ala Ile Val Pro
 85 90 95

Ala Leu His Gln Lys Tyr Val Thr Ala Met Ile Gly Leu Phe Gly Asn
 100 105 110

Ala Ser Asp Arg Leu Cys Gln Lys Leu Asp Lys Ala Ala Ser Asp Gly
 115 120 125

Glu Asp Val Glu Met Glu Ser Leu Phe Ser Arg Leu Thr Leu Asp Val
 130 135 140

Ile Gly Lys Ala Val Phe Asn Tyr Asp Phe Asp Ser Leu Ser Tyr Asp
 145 150 155 160

Asn Gly Ile Val Glu Ala Val Tyr Val Thr Leu Arg Glu Ala Glu Met
 165 170 175

Arg Ser Thr Ser Pro Ile Pro Thr Trp Glu Ile Pro Ile Trp Lys Asp
 180 185 190

Ile Ser Pro Arg Gln Arg Lys Val Asn Glu Ala Leu Ala Leu Ile Asn
 195 200 205

Asn Ile Leu Asp Glu Leu Ile Ala Thr Cys Lys Arg Met Val Asp Glu
 210 215 220

Glu Asp Leu Gln Phe His Glu Glu Tyr Met Asn Glu Lys Asp Pro Ser
 225 230 235 240
 Ile Leu His Phe Leu Leu Ala Ser Gly Asp Asp Val Ser Ser Lys Gln
 245 250 255
 Leu Arg Asp Asp Leu Met Thr Met Leu Ile Ala Gly His Glu Thr Ser
 260 265 270
 Ala Ala Val Leu Thr Trp Thr Phe Tyr Leu Leu Ser Lys Tyr Pro Asn
 275 280 285
 Val Met Ser Lys Leu Gln Ala Glu Ala Asp Ala Val Leu Gly Asp Gly
 290 295 300
 Leu Pro Thr Ile Asp Asp Val Lys Lys Leu Lys Tyr Thr Thr Arg Val
 305 310 315 320
 Ile Asn Glu Ser Leu Arg Leu Tyr Pro Gln Pro Pro Val Leu Ile Arg
 325 330 335
 Arg Ser Leu Glu Asp Asp Met Leu Gly Glu Tyr Pro Ile Gly Lys Gly
 340 345 350
 Glu Asp Ile Phe Ile Ser Ile Trp Asn Leu His Arg Cys Pro Lys His
 355 360 365
 Trp Asp Asp Ala Asp Val Phe Asn Pro Glu Arg Trp Pro Leu Asp Gly
 370 375 380
 Pro Asn Pro Asn Glu Thr Asn Gln Lys Phe Ser Tyr Leu Pro Phe Gly
 385 390 395 400
 Gly Gly Pro Arg Lys Cys Val Gly Asp Met Phe Ala Thr Phe Glu Thr
 405 410 415
 Val Val Ala Thr Ala Met Leu Val Lys Arg Phe Asp Phe Gln Met Ala
 420 425 430
 Pro Gly Ala Pro Pro Val Glu Met Thr Thr Gly Ala Thr Ile His Thr
 435 440 445
 Thr Lys Gly Leu Asn Met Thr Val Thr Arg Arg Ile Lys Pro Pro Val
 450 455 460
 Ile Pro Asn Leu Glu Met Lys Ile Val Ser Asp Pro Glu Gly Ser Thr
 465 470 475 480

Ser Ser Thr Ala Ser Val Ala Val Ser Thr Ala Ser Ile Ala Ser Gly
485 490 495

Glu Gly Gln Gln Val Glu Val Ser Thr Ser Gln Val
500 505

<210> 36
<211> 425
<212> PRT
<213> Glycine max

<400> 36

Gly Lys Gly Leu Ile Pro Ala Asp Gly Glu Ile Trp Arg Val Arg Arg
1 5 10 15

Arg Ala Ile Val Pro Ala Leu His Gln Lys Tyr Val Ala Ala Met Ile
20 25 30

Gly Leu Phe Gly Gln Ala Ala Asp Arg Leu Cys Gln Lys Leu Asp Ala
35 40 45

Ala Ala Ser Asp Gly Glu Asp Val Glu Met Glu Ser Leu Phe Ser Arg
50 55 60

Leu Thr Leu Asp Ile Ile Gly Lys Ala Val Phe Asn Tyr Asp Phe Asp
65 70 75 80

Ser Leu Ser Asn Asp Thr Gly Ile Val Glu Ala Val Tyr Thr Val Leu
85 90 95

Arg Glu Ala Glu Asp Arg Ser Val Ala Pro Ile Pro Val Trp Glu Ile
100 105 110

Pro Ile Trp Lys Asp Ile Ser Pro Arg Leu Arg Lys Val Asn Ala Ala
115 120 125

Leu Lys Phe Ile Asn Asp Thr Leu Asp Asp Leu Ile Ala Ile Cys Lys
130 135 140

Arg Met Val Asp Glu Glu Glu Leu Gln Phe His Glu Glu Tyr Met Asn
145 150 155 160

Glu Gln Asp Pro Ser Ile Leu His Phe Leu Leu Ala Ser Gly Asp Asp
165 170 175

Val Ser Ser Lys Gln Leu Arg Asp Asp Leu Met Thr Met Leu Ile Ala
180 185 190

Gly His Glu Thr Ser Ala Ala Val Leu Thr Trp Thr Phe Tyr Leu Leu
 195 200 205

Ser Lys Glu Pro Arg Val Met Ser Lys Leu Gln Glu Glu Val Asp Ser
 210 215 220

Val Leu Gly Asp Gln Tyr Pro Thr Ile Glu Asp Met Lys Lys Leu Lys
 225 230 235 240

Tyr Thr Thr Arg Val Ile Asn Glu Ser Leu Arg Leu Tyr Pro Gln Pro
 245 250 255

Pro Val Leu Ile Arg Arg Ser Leu Glu Asp Asp Val Leu Gly Glu Tyr
 260 265 270

Pro Ile Lys Arg Gly Glu Asp Ile Phe Ile Ser Val Trp Asn Leu His
 275 280 285

Arg Ser Pro Lys Leu Trp Asp Asp Ala Asp Lys Phe Lys Pro Glu Arg
 290 295 300

Trp Ala Leu Asp Gly Pro Ser Pro Asn Glu Thr Asn Gln Asn Phe Lys
 305 310 315 320

Tyr Leu Pro Phe Gly Gly Gly Pro Arg Lys Cys Val Gly Asp Leu Phe
 325 330 335

Ala Ser Tyr Glu Thr Val Val Ala Leu Ala Met Leu Met Arg Arg Phe
 340 345 350

Asn Phe Gln Ile Ala Val Gly Ala Pro Pro Val Glu Met Thr Thr Gly
 355 360 365

Ala Thr Ile His Thr Thr Gln Gly Leu Lys Met Thr Val Thr His Arg
 370 375 380

Ile Lys Pro Pro Ile Val Pro Ser Leu Gln Met Ser Thr Leu Glu Val
 385 390 395 400

Asp Pro Ser Ile Ser Leu Ser Asp Gln Asp Glu Val Ser Gln Lys Gly
 405 410 415

Glu Val Tyr Gln Ala Gln Ala Gln Ser
 420 425

<210> 37
 <211> 342
 <212> PRT
 <213> Triticum aestivum

<400> 37

Gly Cys Arg Leu Pro Gln Ala Val Gly Ser Leu Ala Ser Val Ala Gly
 1 5 10 15

Glu Ala Phe Phe Leu Pro Leu Tyr Asp Leu Phe Leu Thr Tyr Gly Gly
 20 25 30

Val Phe Arg Leu Asn Phe Gly Pro Lys Ser Phe Leu Ile Val Ser Asp
 35 40 45

Pro Asp Val Ala Lys His Ile Leu Arg Asp Asn Ser Lys Ala Tyr Ser
 50 55 60

Lys Gly Ile Leu Ala Glu Ile Leu Glu Phe Val Met Gly Thr Gly Leu
 65 70 75 80

Ile Pro Ala Asp Gly Glu Val Trp Arg Val Arg Arg Arg Ala Ile Val
 85 90 95

Pro Ala Leu His Gln Lys Tyr Val Thr Ala Met Ile Gly Leu Phe Gly
 100 105 110

Asn Ala Ser Asp Arg Leu Cys Gln Lys Leu Asp Lys Ala Ala Ser Asp
 115 120 125

Gly Glu Asp Val Glu Met Glu Ser Leu Phe Ser Arg Leu Thr Leu Asp
 130 135 140

Val Ile Gly Lys Ala Val Phe Asn Tyr Asp Phe Asp Ser Leu Ser Tyr
 145 150 155 160

Asp Asn Gly Ile Val Glu Ala Val Tyr Val Thr Leu Arg Glu Ala Glu
 165 170 175

Met Arg Ser Thr Ser Pro Ile Pro Thr Trp Glu Ile Pro Ile Trp Lys
 180 185 190

Asp Ile Ser Pro Arg Gln Cys Pro Lys His Trp Asp Asp Ala Asp Val
 195 200 205

Phe Asn Pro Glu Arg Trp Pro Leu Asp Gly Pro Asn Pro Asn Glu Thr
 210 215 220

Asn Gln Lys Phe Ser Tyr Leu Pro Phe Gly Gly Gly Pro Arg Lys Cys
 225 230 235 240

Val Gly Asp Met Phe Ala Thr Phe Glu Thr Val Val Ala Thr Ala Met
 245 250 255

Leu Val Lys Arg Phe Asp Phe Gln Met Ala Pro Gly Ala Pro Pro Val
 260 265 270

Glu Met Thr Thr Gly Ala Thr Ile His Thr Thr Lys Gly Leu Asn Met
 275 280 285

Thr Val Thr Arg Arg Ile Lys Pro Pro Val Ile Pro Asn Leu Glu Met
 290 295 300

Lys Ile Val Ser Asp Ser Glu Gly Ser Thr Ser Ser Thr Ala Ser Val
 305 310 315 320

Ala Val Ser Thr Ala Ser Ile Ala Ser Gly Glu Gly Gln Gln Val Glu
 325 330 335

Val Ser Thr Ser Gln Val
 340

<210> 38
 <211> 579
 <212> PRT
 <213> Lycopersicon esculentum
 <400> 38

Gln Phe Pro Thr His His Tyr Ser Lys Ser Arg Leu Thr Leu Ser Pro
 1 5 10 15

Lys Phe Lys Gly Ser Val Ser Asn Phe Thr Ile Arg Cys Ser Asn Ser
 20 25 30

Asn Gly Lys Gln Pro Glu Ser Val Asp Glu Gly Val Lys Lys Val Glu
 35 40 45

Lys Leu Leu Asp Glu Lys Arg Arg Ala Glu Leu Ser Ala Arg Ile Ala
 50 55 60

Ser Gly Glu Phe Thr Val Glu Gln Ser Gly Phe Pro Ser Leu Leu Lys
 65 70 75 80

Asn Gly Leu Ser Lys Leu Gly Val Pro Lys Glu Phe Leu Glu Phe Phe
 85 90 95

Ser Arg Arg Thr Gly Asn Tyr Pro Arg Ile Pro Glu Ala Lys Gly Ser
 100 105 110

Ile Ser Ala Ile Arg Asp Glu Pro Phe Phe Met Pro Leu Tyr Glu Leu
 115 120 125

Tyr Leu Thr Tyr Gly Gly Ile Phe Arg Leu Ile Phe Gly Pro Lys Ser
 130 135 140

Phe Leu Ile Val Ser Asp Pro Ser Ile Ala Lys His Ile Leu Lys Asp
 145 150 155 160

Asn Ser Lys Ala Tyr Ser Lys Gly Ile Leu Ala Glu Ile Leu Asp Phe
 165 170 175

Val Met Gly Lys Gly Leu Ile Pro Ala Asp Gly Glu Ile Trp Arg Val
 180 185 190

Arg Arg Arg Ala Ile Val Pro Ala Leu His Gln Lys Tyr Val Ala Ala
 195 200 205

Met Ile Gly Leu Phe Gly Lys Ala Thr Asp Arg Leu Cys Lys Lys Leu
 210 215 220

Asp Val Ala Ala Thr Asp Gly Glu Asp Val Glu Met Glu Ser Leu Phe
 225 230 235 240

Ser Arg Leu Thr Leu Asp Ile Ile Gly Lys Ala Val Phe Asn Tyr Asp
 245 250 255

Phe Asp Ser Leu Thr Val Asp Thr Gly Ile Val Glu Ala Val Tyr Thr
 260 265 270

Val Leu Arg Glu Ala Glu Asp Arg Ser Val Ala Pro Ile Pro Val Trp
 275 280 285

Glu Leu Pro Ile Trp Lys Asp Ile Ser Pro Lys Leu Lys Lys Val Asn
 290 295 300

Ala Ala Leu Lys Leu Ile Asn Asp Thr Leu Asp Asp Leu Ile Ala Ile
 305 310 315 320

Cys Lys Arg Met Val Asp Glu Glu Glu Leu Gln Phe His Glu Glu Tyr
 325 330 335

Met Asn Glu Lys Asp Pro Ser Ile Leu His Phe Leu Leu Ala Ser Gly
 340 345 350

Asp Glu Val Ser Ser Lys Gln Leu Arg Asp Asp Leu Met Thr Met Leu
 355 360 365

Ile Ala Gly His Glu Thr Ser Ala Ala Val Leu Thr Trp Thr Phe Tyr
 370 375 380

Leu Leu Ser Lys Glu Pro Ser Val Met Ala Lys Leu Gln Asp Glu Val
 385 390 395 400

Asp Ser Val Leu Gly Asp Arg Leu Pro Thr Ile Glu Asp Leu Lys Lys
 405 410 415

Leu Arg Tyr Thr Thr Arg Val Ile Asn Glu Ser Leu Arg Leu Tyr Pro
 420 425 430

Gln Pro Pro Val Leu Ile Arg Arg Ser Ile Glu Glu Asp Val Val Gly
 435 440 445

Gly Tyr Pro Ile Lys Arg Gly Glu Asp Ile Phe Ile Ser Val Trp Asn
 450 455 460

Leu His Arg Cys Pro Asn His Trp Glu Glu Ala Asp Arg Phe Asn Pro
 465 470 475 480

Glu Arg Trp Pro Leu Asp Gly Pro Asn Pro Asn Glu Thr Asn Gln Asn
 485 490 495

Phe Ser Tyr Leu Pro Phe Gly Gly Gly Pro Arg Lys Cys Val Gly Asp
 500 505 510

Met Phe Ala Thr Phe Glu Asn Leu Val Ala Val Ala Met Leu Val Gln
 515 520 525

Arg Phe Asp Phe Gln Met Ala Leu Gly Ala Pro Pro Val Lys Met Thr
 530 535 540

Thr Gly Ala Thr Ile His Thr Thr Glu Gly Leu Lys Met Thr Val Thr
 545 550 555 560

Arg Arg Ser Arg Pro Pro Ile Val Pro Asn Leu Glu Met Ala Thr Leu
 565 570 575

Glu Val Asp

<210> 39
 <211> 367
 <212> PRT
 <213> Chlamydomonas reinhardtii

<400> 39

Ala Arg Arg Arg Ala Val Val Pro Ala Leu His Arg Lys Tyr Val Met
 1 5 10 15

Ser Met Val Asp Met Phe Gly Asp Cys Ala Ala His Gly Ala Ser Ala
 20 25 30

Thr Leu Asp Lys Tyr Ala Ala Ser Gly Thr Ser Leu Asp Met Glu Asn
 35 40 45

Phe Phe Ser Arg Leu Gly Leu Asp Ile Ile Gly Lys Ala Val Phe Asn
 50 55 60

Tyr Asp Phe Asp Ser Leu Ala His Asp Asp Pro Val Ile Gln Ala Val
 65 70 75 80

Tyr Thr Leu Leu Arg Glu Ala Glu His Arg Ser Thr Ala Pro Ile Ala
 85 90 95

Tyr Trp Asn Ile Pro Gly Ile Gln Phe Val Val Pro Arg Gln Lys Arg
 100 105 110

Cys Gln Glu Ala Leu Val Leu Val Asn Glu Cys Leu Asp Gly Leu Ile
 115 120 125

Asp Lys Cys Lys Lys Leu Val Glu Glu Glu Asp Ala Val Phe Gly Glu
 130 135 140

Glu Phe Leu Ser Glu Arg Asp Pro Ser Ile Leu His Phe Leu Leu Ala
 145 150 155 160

Ser Gly Asp Glu Ile Ser Ser Lys Gln Leu Arg Asp Asp Leu Met Thr
 165 170 175

Met Leu Ile Ala Gly His Glu Thr Thr Ala Ala Val Leu Thr Trp Thr
 180 185 190

Leu Tyr Leu Leu Ser Gln His Pro Glu Ala Ala Ala Ala Ile Arg Lys
 195 200 205

Glu Val Asp Glu Leu Leu Gly Asp Arg Lys Pro Gly Val Glu Asp Leu
 210 215 220

Arg Ala Leu Lys Met Thr Thr Arg Val Ile Asn Glu Ala Met Arg Leu
225 230 235 240

Tyr Pro Gln Pro Pro Val Leu Ile Arg Arg Ala Leu Gln Asp Asp His
245 250 255

Phe Asp Gln Phe Thr Val Pro Ala Gly Ser Asp Leu Phe Ile Ser Val
260 265 270

Trp Asn Leu His Arg Ser Pro Lys Leu Trp Asp Glu Pro Asp Lys Phe
275 280 285

Lys Pro Glu Arg Phe Gly Pro Leu Asp Ser Pro Ile Pro Asn Glu Val
290 295 300

Thr Glu Asn Phe Ala Tyr Leu Pro Phe Gly Gly Gly Arg Arg Lys Cys
305 310 315 320

Ile Gly Asp Gln Phe Ala Leu Phe Glu Ala Val Val Ala Leu Ala Met
325 330 335

Leu Met Arg Arg Tyr Glu Phe Asn Leu Asp Glu Ser Lys Gly Thr Val
340 345 350

Gly Met Thr Thr Gly Ala Thr Ile His Thr Thr Asn Gly Leu Asn
355 360 365

<210> 40
<211> 2057
<212> DNA
<213> Arabidopsis thaliana

<400> 40
gtgatttgag tttttatttt gcggtggcgt tgtatggcta tggcctttcc tctttcttat 60
actccgacga ttactgttaa accagtaacg tactctcgga gatcgaactt tgtagttttc 120
tcgtcgagtt ctaatggacg agatccttta gaggagaatt cagtacctaa tgggtgtgaaa 180
agcttgagga agcttcaaga agagaagcgt cgtgctgagt tatctgctag gattgcttct 240
ggagctttca ctgtacggaa atctagtttt ccatctacag tgaagaatgg tttatctaag 300
attggaatac caagcaatgt tcttgatttc atgtttgatt ggactgggtc tgaccaagac 360
taccccaagg ttcttgaggc taaaggctcg attcaggcgg tccggaacga agctttcttc 420
atccctttgt atgagctttt ccttacttat ggtggaattt tcagggtgac ctttgggcct 480
aagtcattct tgatcgtgtc ggatccttct attgctaaac atatattgaa ggacaatgca 540
aaagcttact ccaaggggat tttagctgaa attctagatt ttgtgatggg aaaaggactc 600

attcctgctg atggggagat atggcgtaga cgaaggcgtg ccattgttcc tgcattgcat	660
caaaagtatg tagcagctat gattagttta ttcggagaag cttcagatag gctttgtcag	720
aagcttgatg ctgctgcatt gaaaggggaa gaagtagaga tggaatcact cttctctcgt	780
ttgacacttg atattattgg caaggcgggtt ttcaattacg actttgactc ctttactaat	840
gataccggtg tgatcgaggc agtgtacact gttctaagag aagctgaaga cagaagtgtt	900
tcacctattc ctgtttggga cataccattc tggaaagata tttccccacg tcagaggaaa	960
gttgctactt ctttgaaatt aatcaatgac acacttgatg atttgattgc aacatgcaag	1020
agaatggtag aagaagagga gttgcagttt cacgaggagt atatgaacga aagagatcct	1080
agcatccttc actttctttt agcttcagga gatgatgtct ctagtaagca gcttcgtgat	1140
gacttgatga caatgcttat agccggacat gaaacatcgg cggcagtatt aacatggacc	1200
ttttaccttt taacaacgga accaagtgtg gttgccaaac ttcaagaaga gggtgattct	1260
gtaattggag atagattccc aaccatacaa gatatgaaaa agctgaaata cactactcga	1320
gtcatgaatg agtcattgag attatatcca caaccaccag tactgatccg tcgttctata	1380
gataatgata tacttggaga gtatccgata aaaaggggag aggatatctt catctcgggt	1440
tggaatctac atcgaagtcc tctgcattgg gatgatgcag agaagttcaa tcccgagaga	1500
tggccttttg atggacccaa cccaaatgag acaaaccaaa acttcagtta cttacctttc	1560
gggtggaggac cgcggaatg tataggcgac atgtttgctt cttttgagaa tgtggtagca	1620
atcgcaatgc ttattcgaag atttaacttt cagattgcac caggagctcc tccggtgaaa	1680
atgactacag gagctacaat acacaccaca gaaggattga aattgacagt aacaaagagg	1740
acaaaacctc tggacatacc atccgtaccg atacttccaa tggatacttc acgggatgaa	1800
gtttcatctg ctctttctta agtcttcac tttacaaaac tgaaaacaaa caagctcaga	1860
tgaagaagca aaaatcttgt gttagaacag caaatgttga attgttggaa catgaccaat	1920
gctttctgat tatttatctg cactgtaaaa tgcagacaag taaaatgaga agatttatta	1980
ttctttggaa aaaaaaatg tttttgtctg cacagtgaag ataataaac ttctgggttc	2040
tatgtaaaaa aaaaaac	2057

<210> 41
 <211> 1788
 <212> DNA
 <213> *Arabidopsis thaliana*

<400> 41
atggctatgg cctttcctct ttcttatact ccgacgatta ctgttaaacc agtaacgtac 60
tctcggagat cgaactttgt agttttctcg tcgagttcta atggacgaga tccttttagag 120
gagaattcag tacctaattg tgtgaaaagc ttggagaagc ttcaagaaga gaagcgtcgt 180
gctgagttat ctgctaggat tgcttctgga gctttcactg tacggaaatc tagttttcca 240
tctacagtga agaattggtt atctaagatt ggaataccaa gcaatgttct tgatttcattg 300
tttgattgga ctggttctga ccaagactac cccaaggttc ctgaggctaa aggctcgatt 360
caggcgggcc ggaacgaagc tttcttcac cctttgtatg agcttttcct tacttatggg 420
ggaattttca ggttgacctt tgggcctaag tcattcttga tcgtgtcggg tccttctatt 480
gctaaacata tattgaagga caatgcaaaa gcttactcca aggggatttt agctgaaatt 540
ctagattttg tgatgggaaa aggactcatt cctgctgatg gggagatatg gcgtagacga 600
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 <211> 5071
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 <213> *Oryza sativa*

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<210> 43
 <211> 1899
 <212> DNA
 <213> *Oryza sativa*

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<210> 44
 <211> 1527
 <212> DNA
 <213> Hordeum vulgare

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<210> 45
 <211> 1278
 <212> DNA
 <213> Glycine max

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<210> 46
 <211> 1031
 <212> DNA
 <213> *Triticum aestivum*

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 <211> 1737
 <212> DNA
 <213> *Lycopersicon esculentum*

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tgtaagagga	tggtagacga	agaagagttg	cagtttcacg	aggaatacat	gaatgaaaaa	1020
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cgtgatgacc	tcatgacaat	gcttatagcg	ggacatgaaa	catctgcagc	agtgtcaca	1140
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gattcagttc	taggggatag	gttaccaacc	attgaagatc	taaagaaact	cagatacaca	1260
actcgtgtga	ttaatgagtc	tttaagacta	tatccacagc	caccagtctt	gattcgtcgt	1320
tctattgaag	aggacgtagt	tggaggttac	ccgattaaaa	ggggtgaaga	cattttcatt	1380
tctgtttgga	acttgcacg	atgcccgaat	cattgggaag	aagccgatag	attcaatcct	1440
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cccttcggtg	gtggaccaag	aaaatgtgtg	ggagacatgt	ttgccacatt	tgagaattta	1560
gtagcagttg	caatgcttgt	tcaacgattt	gattttcaaa	tggctcttgg	agctcctcct	1620
gttaaaatga	caactggggc	taccatccac	accacagaag	gattaaaaat	gactgtaaca	1680
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<210> 48

<211> 1101

<212> DNA

<213> Chlamydomonas reinhardtii

<400> 48

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ggcaccagcc	tggacatgga	aaacttcttc	agccggctgg	gtctggacat	catcggcaag	180
gccgtgttca	actacgactt	cgactcgctg	gcgcacgacg	accccgatcat	ccaggccgctg	240
tacacgttgc	tgcgcaagc	ggagcaccgc	tccacagcgc	ccatcgctta	ctggaacatt	300
cccggcatcc	agtttgtggg	gccgcggcag	aagcgctgcc	aggaggcgct	ggtgctggta	360

aatgagtgcc tggacggcct catcgacaag tgcaagaagc tggtcgagga ggaggacgcg 420
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 tctggagacg agatttcctc gaagcagttg cgcgatgacc tgatgactat gctgattgcg 540
 gggcacgaga ccaccgccgc cgtgctgacg tggacgctgt acctgctgtc ccaacacccc 600
 gaggcggcag cggccatccg caaggaggta gacgagctcc ttggggaccg caagcccggg 660
 gtggaagacc tcagagcgt caagatgacg actcgcgtca tcaacgaggc gatgcggctc 720
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<210> 49
 <211> 576
 <212> PRT
 <213> Arabidopsis thaliana

<400> 49

Met Ala Phe Pro Ala Ala Ala Thr Tyr Pro Thr His Phe Gln Gly Gly
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Gln Thr Ile Ser Ser Val Asn Ser Arg Arg Ala Ser Val Ser Ile Lys
 35 40 45

Cys Gln Ser Thr Glu Pro Lys Thr Asn Gly Asn Ile Leu Asp Asn Ala
 50 55 60

Ser Asn Leu Leu Thr Asn Phe Leu Ser Gly Gly Ser Leu Gly Ser Met
 65 70 75 80

Pro Thr Ala Glu Gly Ser Val Ser Asp Leu Phe Gly Lys Pro Leu Phe
 85 90 95

Leu Ser Leu Tyr Asp Trp Phe Leu Glu His Gly Gly Ile Tyr Lys Leu
 100 105 110

Ala Phe Gly Pro Lys Ala Phe Val Val Ile Ser Asp Pro Ile Ile Ala
 115 120 125

Arg His Val Leu Arg Glu Asn Ala Phe Ser Tyr Asp Lys Gly Val Leu
 130 135 140

Ala Glu Ile Leu Glu Pro Ile Met Gly Lys Gly Leu Ile Pro Ala Asp
 145 150 155 160

Leu Asp Thr Trp Lys Leu Arg Arg Arg Ala Ile Thr Pro Ala Phe His
 165 170 175

Lys Leu Tyr Leu Glu Ala Met Val Lys Val Phe Ser Asp Cys Ser Glu
 180 185 190

Lys Met Ile Leu Lys Ser Glu Lys Leu Ile Arg Glu Lys Glu Thr Ser
 195 200 205

Ser Gly Glu Asp Thr Ile Glu Leu Asp Leu Glu Ala Glu Phe Ser Ser
 210 215 220

Leu Ala Leu Asp Ile Ile Gly Leu Ser Val Phe Asn Tyr Asp Phe Gly
 225 230 235 240

Ser Val Thr Lys Glu Ser Pro Val Ile Lys Ala Val Tyr Gly Thr Leu
 245 250 255

Phe Glu Ala Glu His Arg Ser Thr Phe Tyr Phe Pro Tyr Trp Asn Phe
 260 265 270

Pro Pro Ala Arg Trp Ile Val Pro Arg Gln Arg Lys Phe Gln Ser Asp
 275 280 285

Leu Lys Ile Ile Asn Asp Cys Leu Asp Gly Leu Ile Gln Asn Ala Lys
 290 295 300

Glu Thr Arg Gln Glu Thr Asp Val Glu Lys Leu Gln Glu Arg Asp Tyr
 305 310 315 320

Thr Asn Leu Lys Asp Ala Ser Leu Leu Arg Phe Leu Val Asp Met Arg
 325 330 335

Gly Val Asp Ile Asp Asp Arg Gln Leu Arg Asp Asp Leu Met Thr Met
 340 345 350

Leu Ile Ala Gly His Glu Thr Thr Ala Ala Val Leu Thr Trp Ala Val
 355 360 365

Phe Leu Leu Ser Gln Asn Pro Glu Lys Ile Arg Lys Ala Gln Ala Glu
 370 375 380

Ile Asp Ala Val Leu Gly Gln Gly Pro Pro Thr Tyr Glu Ser Met Lys
 385 390 395 400

Lys Leu Glu Tyr Ile Arg Leu Ile Val Val Glu Val Leu Arg Leu Phe
 405 410 415

Pro Gln Pro Pro Leu Leu Ile Arg Arg Thr Leu Lys Pro Glu Thr Leu
 420 425 430

Pro Gly Gly His Lys Gly Glu Lys Glu Gly His Lys Val Pro Lys Gly
 435 440 445

Thr Asp Ile Phe Ile Ser Val Tyr Asn Leu His Arg Ser Pro Tyr Phe
 450 455 460

Trp Asp Asn Pro His Asp Phe Glu Pro Glu Arg Phe Leu Arg Thr Lys
 465 470 475 480

Glu Ser Asn Gly Ile Glu Gly Trp Ala Gly Phe Asp Pro Ser Arg Ser
 485 490 495

Pro Gly Ala Leu Tyr Pro Asn Glu Ile Ile Ala Asp Phe Ala Phe Leu
 500 505 510

Pro Phe Gly Gly Gly Pro Arg Lys Cys Ile Gly Asp Gln Phe Ala Leu
 515 520 525

Met Glu Ser Thr Val Ala Leu Ala Met Leu Phe Gln Lys Phe Asp Val
 530 535 540

Glu Leu Arg Gly Thr Pro Glu Ser Val Glu Leu Val Ser Gly Ala Thr
 545 550 555 560

Ile His Ala Lys Asn Gly Met Trp Cys Lys Leu Lys Arg Arg Ser Lys
 565 570 575

<210> 50
 <211> 552
 <212> PRT
 <213> Pisum sativum

<400> 50

Met Val Ala Ala Pro Ile Ser Thr Val Lys Leu Thr Asp Ala Asn Leu
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His Thr Arg Phe His Ser Ser Ser Ser Thr Pro Ser Thr Leu Ser
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Leu Pro Leu Ser Leu His Phe His Phe Ser Ser His Ser Lys Arg Phe
 35 40 45

Ser Ser Ile Arg Cys Gln Ser Val Asn Gly Glu Lys Arg Lys Gln Ser
 50 55 60

Ser Arg Asn Val Phe Asp Asn Ala Ser Asn Leu Leu Thr Ser Leu Leu
 65 70 75 80

Ser Gly Ala Asn Leu Gly Ser Met Pro Ile Ala Glu Gly Ala Val Thr
 85 90 95

Asp Leu Phe Asp Arg Pro Leu Phe Phe Ser Leu Tyr Asp Trp Phe Leu
 100 105 110

Glu His Gly Ser Val Tyr Lys Leu Ala Phe Gly Pro Lys Ala Phe Val
 115 120 125

Val Val Ser Asp Pro Ile Val Ala Arg His Ile Leu Arg Glu Asn Ala
 130 135 140

Phe Ser Tyr Asp Lys Gly Val Leu Ala Asp Ile Leu Glu Pro Ile Met
 145 150 155 160

Gly Lys Gly Leu Ile Pro Ala Asp Leu Glu Thr Trp Lys Gln Arg Arg
 165 170 175

Arg Val Ile Ala Pro Gly Phe His Thr Ser Tyr Leu Glu Ala Met Val
 180 185 190

Gln Leu Phe Thr Ser Cys Ser Glu Arg Thr Val Leu Lys Val Asn Glu
 195 200 205

Leu Leu Glu Gly Glu Gly Arg Asp Gly Gln Lys Ser Val Glu Leu Asp
 210 215 220

Leu Glu Ala Glu Phe Ser Asn Leu Ala Leu Glu Ile Ile Gly Leu Gly
 225 230 235 240
 Val Phe Asn Tyr Asp Phe Gly Ser Val Thr Asn Glu Ser Pro Val Ile
 245 250 255
 Lys Ala Val Tyr Gly Thr Leu Phe Glu Ala Glu His Arg Ser Thr Phe
 260 265 270
 Tyr Ile Pro Tyr Trp Lys Phe Pro Leu Ala Arg Trp Ile Val Pro Arg
 275 280 285
 Gln Arg Lys Phe Gln Asp Asp Leu Lys Val Ile Asn Thr Cys Leu Asp
 290 295 300
 Gly Leu Ile Arg Asn Ala Lys Glu Ser Arg Gln Glu Thr Asp Val Glu
 305 310 315 320
 Lys Leu Gln Gln Arg Asp Tyr Ser Asn Leu Lys Asp Ala Ser Leu Leu
 325 330 335
 Arg Phe Leu Val Asp Met Arg Gly Val Asp Val Asp Asp Arg Gln Leu
 340 345 350
 Arg Asp Asp Leu Met Thr Met Leu Ile Ala Gly His Glu Thr Thr Ala
 355 360 365
 Ala Val Leu Thr Trp Ala Val Phe Leu Leu Ala Gln Asn Pro Asp Lys
 370 375 380
 Met Lys Lys Ala Gln Ala Glu Val Asp Leu Val Leu Gly Met Gly Lys
 385 390 395 400
 Pro Thr Phe Glu Leu Leu Lys Lys Leu Glu Tyr Ile Arg Leu Ile Val
 405 410 415
 Val Glu Thr Leu Arg Leu Tyr Pro Gln Pro Pro Leu Leu Ile Arg Arg
 420 425 430
 Ser Leu Lys Pro Asp Val Leu Pro Gly Gly His Lys Gly Asp Lys Asp
 435 440 445
 Gly Tyr Thr Ile Pro Ala Gly Thr Asp Val Phe Ile Ser Val Tyr Asn
 450 455 460
 Leu His Arg Ser Pro Tyr Phe Trp Asp Arg Pro Asn Asp Phe Glu Pro
 465 470 475 480

Glu Arg Phe Leu Val Gln Asn Asn Asn Glu Glu Val Glu Gly Trp Ala
485 490 495

Gly Phe Asp Pro Ser Arg Ser Pro Gly Ala Leu Tyr Pro Asn Glu Ile
500 505 510

Ile Ser Asp Phe Ala Phe Leu Pro Phe Gly Gly Gly Pro Arg Lys Cys
515 520 525

Val Gly Asp Gln Phe Ala Leu Met Glu Ser Thr Val Ala Leu Val Cys
530 535 540

Cys Tyr Arg Ile Ser Met Trp Asn
545 550

<210> 51
<211> 576
<212> PRT
<213> Glycine max

<400> 51

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Leu His Ser Arg Phe His Ser Arg Leu Val Pro Phe Thr His His Phe
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Ser Leu Ser Gln Pro Lys Arg Ile Ser Ser Ile Arg Cys Gln Ser Ile
35 40 45

Asn Thr Asp Lys Lys Lys Ser Ser Arg Asn Leu Leu Gly Asn Ala Ser
50 55 60

Asn Leu Leu Thr Asp Leu Leu Ser Gly Gly Ser Ile Gly Ser Met Pro
65 70 75 80

Ile Ala Glu Gly Ala Val Ser Asp Leu Leu Gly Arg Pro Leu Phe Phe
85 90 95

Ser Leu Tyr Asp Trp Phe Leu Glu His Gly Ala Val Tyr Lys Leu Ala
100 105 110

Phe Gly Pro Lys Ala Phe Val Val Val Ser Asp Pro Ile Val Ala Arg
115 120 125

His Ile Leu Arg Glu Asn Ala Phe Ser Tyr Asp Lys Gly Val Leu Ala
130 135 140

Asp Ile Leu Glu Pro Ile Met Gly Lys Gly Leu Ile Pro Ala Asp Leu
 145 150 155 160

Asp Thr Trp Lys Gln Arg Arg Arg Val Ile Ala Pro Ala Phe His Asn
 165 170 175

Ser Tyr Leu Glu Ala Met Val Lys Ile Phe Thr Thr Cys Ser Glu Arg
 180 185 190

Thr Ile Leu Lys Phe Asn Lys Leu Leu Glu Gly Glu Gly Tyr Asp Gly
 195 200 205

Pro Asp Ser Ile Glu Leu Asp Leu Glu Ala Glu Phe Ser Ser Leu Ala
 210 215 220

Leu Asp Ile Ile Gly Leu Gly Val Phe Asn Tyr Asp Phe Gly Ser Val
 225 230 235 240

Thr Lys Glu Ser Pro Val Ile Lys Ala Val Tyr Gly Thr Leu Phe Glu
 245 250 255

Ala Glu His Arg Ser Thr Phe Tyr Ile Pro Tyr Trp Lys Ile Pro Leu
 260 265 270

Ala Arg Trp Ile Val Pro Arg Gln Arg Lys Phe Gln Asp Asp Leu Lys
 275 280 285

Val Ile Asn Thr Cys Leu Asp Gly Leu Ile Arg Asn Ala Lys Glu Ser
 290 295 300

Arg Gln Glu Thr Asp Val Glu Lys Leu Gln Gln Arg Asp Tyr Leu Asn
 305 310 315 320

Leu Lys Asp Ala Ser Leu Leu Arg Phe Leu Val Asp Met Arg Gly Ala
 325 330 335

Asp Val Asp Asp Arg Gln Leu Arg Asp Asp Leu Met Thr Met Leu Ile
 340 345 350

Ala Gly His Glu Thr Thr Ala Ala Val Leu Thr Trp Ala Val Phe Leu
 355 360 365

Leu Ala Gln Asn Pro Ser Lys Met Lys Lys Ala Gln Ala Glu Val Asp
370 375 380

Leu Val Leu Gly Thr Gly Arg Pro Thr Phe Glu Ser Leu Lys Glu Leu
385 390 395 400

Gln Tyr Ile Arg Leu Ile Val Val Glu Ala Leu Arg Leu Tyr Pro Gln
405 410 415

Pro Pro Leu Leu Ile Arg Arg Ser Leu Lys Ser Asp Val Leu Pro Gly
420 425 430

Gly His Lys Gly Glu Lys Asp Gly Tyr Ala Ile Pro Ala Gly Thr Asp
435 440 445

Val Phe Ile Ser Val Tyr Asn Leu His Arg Ser Pro Tyr Phe Trp Asp
450 455 460

Arg Pro Asp Asp Phe Glu Pro Glu Arg Phe Leu Val Gln Asn Lys Asn
465 470 475 480

Glu Glu Ile Glu Gly Trp Ala Gly Leu Asp Pro Ser Arg Ser Pro Gly
485 490 495

Ala Leu Tyr Pro Asn Glu Val Ile Ser Asp Phe Ala Phe Leu Pro Phe
500 505 510

Gly Gly Gly Pro Arg Lys Cys Val Gly Asp Gln Phe Ala Leu Met Glu
515 520 525

Ser Thr Val Ala Leu Thr Met Leu Leu Gln Asn Phe Asp Val Glu Leu
530 535 540

Lys Gly Thr Pro Glu Ser Val Glu Leu Val Thr Gly Ala Thr Ile His
545 550 555 560

Thr Lys Asn Gly Leu Trp Cys Asn Leu Arg Lys Arg Ser Ser Leu His
565 570 575

<210> 52
<211> 588
<212> PRT
<213> Oryza sativa

<400> 52

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Pro Pro Pro Pro Pro Leu Val Ser Pro Arg Leu Arg Arg Gly His Val
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Arg Leu Arg Leu Arg Pro Pro Arg Ser Ser Gly Gly Gly Phe Thr Gly
35 40 45

Gly Gly Gly Ala Gly Gly Asp Glu Pro Pro Ile Thr Thr Ser Trp Val
50 55 60

Ser Pro Asp Trp Leu Thr Ala Leu Ser Arg Ser Val Ala Thr Arg Leu
65 70 75 80

Gly Gly Gly Asp Asp Ser Gly Ile Pro Val Ala Ser Ala Lys Leu Asp
85 90 95

Asp Val Arg Asp Leu Leu Gly Gly Ala Leu Phe Leu Pro Leu Phe Lys
100 105 110

Trp Phe Arg Glu Glu Gly Pro Val Tyr Arg Leu Ala Ala Gly Pro Arg
115 120 125

Asp Leu Val Val Val Ser Asp Pro Ala Val Ala Arg His Val Leu Arg
130 135 140

Gly Tyr Gly Ser Arg Tyr Glu Lys Gly Leu Val Ala Glu Val Ser Glu
145 150 155 160

Phe Leu Phe Gly Ser Gly Phe Ala Ile Ala Glu Gly Ala Leu Trp Thr
165 170 175

Val Arg Arg Arg Ser Val Val Pro Ser Leu His Lys Arg Phe Leu Ser
180 185 190

Val Met Val Asp Arg Val Phe Cys Lys Cys Ala Glu Arg Leu Val Glu
195 200 205

Lys Leu Glu Thr Ser Ala Leu Ser Gly Lys Pro Val Asn Met Glu Ala
210 215 220

Arg Phe Ser Gln Met Thr Leu Asp Val Ile Gly Leu Ser Leu Phe Asn
225 230 235 240

Tyr Asn Phe Asp Ser Leu Thr Ser Asp Ser Pro Val Ile Asp Ala Val
245 250 255

Tyr Thr Ala Leu Lys Glu Ala Glu Leu Arg Ser Thr Asp Leu Leu Pro
260 265 270

Tyr Trp Lys Ile Asp Leu Leu Cys Lys Ile Val Pro Arg Gln Ile Lys
275 280 285

Ala Glu Lys Ala Val Asn Ile Ile Arg Asn Thr Val Glu Asp Leu Ile
290 295 300

Thr Lys Cys Lys Lys Ile Val Asp Ala Glu Asn Glu Gln Ile Glu Gly
305 310 315 320

Glu Glu Tyr Val Asn Glu Ala Asp Pro Ser Ile Leu Arg Phe Leu Leu
325 330 335

Ala Ser Arg Glu Glu Val Thr Ser Val Gln Leu Arg Asp Asp Leu Leu
340 345 350

Ser Met Leu Val Ala Gly His Glu Thr Thr Gly Ser Val Leu Thr Trp
355 360 365

Thr Ile Tyr Leu Leu Ser Lys Asp Pro Ala Ala Leu Arg Arg Ala Gln
370 375 380

Ala Glu Val Asp Arg Val Leu Gln Gly Arg Leu Pro Arg Tyr Glu Asp
385 390 395 400

Leu Lys Glu Leu Lys Tyr Leu Met Arg Cys Ile Asn Glu Ser Met Arg
405 410 415

Leu Tyr Pro His Pro Pro Val Leu Ile Arg Arg Ala Ile Val Asp Asp
420 425 430

Val Leu Pro Gly Asn Tyr Lys Ile Lys Ala Gly Gln Asp Ile Met Ile
435 440 445

Ser Val Tyr Asn Ile His Arg Ser Pro Glu Val Trp Asp Arg Ala Asp
450 455 460

Asp Phe Ile Pro Glu Arg Phe Asp Leu Glu Gly Pro Val Pro Asn Glu
465 470 475 480

Thr Asn Thr Glu Tyr Arg Phe Ile Pro Phe Ser Gly Gly Pro Arg Lys
485 490 495

Cys Val Gly Asp Gln Phe Ala Leu Leu Glu Ala Ile Val Ala Leu Ala
500 505 510

Val Val Leu Gln Lys Met Asp Phe Thr Ile Glu Leu Val Pro Asp Gln
515 520 525

Lys Ile Asn Met Thr Thr Gly Ala Thr Ile His Thr Thr Asn Gly Leu
530 535 540

Tyr Met Asn Val Val Asn Ile Gly Val Gln Val Asp Glu Ala Arg Lys
545 550 555 560

His Gly Tyr Asn Ser Phe Ile Val Tyr Gly Tyr Thr Leu Tyr Ala Tyr
565 570 575

Ile Ser Pro Arg Ile Trp Ser Ala Met Pro Val Leu
580 585

<210> 53
<211> 1734
<212> DNA
<213> Arabidopsis thaliana

<400> 53
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aaatgcattg gagaccagtt tgcactaatg gaatcgaccg tcgcactagc tatgttggtt	1620
cagaaattcg atgtggagct gcgtggaacg ccagaatctg ttgaactcgt gagcggcgca	1680
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 <211> 1926
 <212> DNA
 <213> Pisum sativum

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tatggcactc tttttgaagc cgaacataga tccactttct atattccata ttggaaattt	900

ccattagcaa ggtggattgt gcccaggcaa aggaagtttc aggatgacct taaagtcatt	960
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cctgaacgat ttctagtga aaacaataat gaagaagttg aagggtgggc tggttttgac	1560
ccatctcgaa gtcctggagc cttgtatcca aacgagatta tatcagattt tgcattcttg	1620
ccttttgggtg gtggaccacg aaaatgcgtt ggagaccaat ttgctctcat ggaatccact	1680
gtagcgctag tatgctgcta cagaatttcg atgtggaact gaaggggacc cctgaatcgg	1740
ttgaactagt tactggggca actatccata ccaaaaatgg attgtggtgc aatttgagga	1800
agagatctag ttacattga catgttaact gcaacatttt tcttatgcag aatgatgtac	1860
aaaatattta tcatttaaaa tgacattaac attgaatagt gtctaataca gctaaaggg	1920
atttac	1926

<210> 55
 <211> 1731
 <212> DNA
 <213> Glycine max

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tcttcaatca gatgccaatc aattaatacc gataagaaga aatcaagtag aaatctgctg	180
ggcaatgcaa gtaacctcct cacggactta ttaagtgggtg gaagtatagg gtctatgccc	240
atagctgaag gtgcagtctc agatctgctt ggtcgacctc tctttttctc actgtatgat	300
tggttcttgg agcatgggtgc ggtgtataaa cttgcctttg gaccaaagc atttgttggt	360
gtatcagatc ccatagttgc tagacatatt ctgcgagaaa atgcattttc ttatgacaag	420
ggagtacttg ctgatatcct tgaaccaata atgggcaaag gactcatacc agcagacctt	480
gatacttgga agcaaaggag aagagtcatt gctccggctt tccataactc atacttgga	540
gctatgggtta aaatattcac aacttggttca gaaagaacaa tattgaagtt taataagctt	600

cttgaaggag agggttatga tggacctgac tcaattgaat 'tggatcttga ggcagagttt 660
 tctagtttgg ctcttgatat tattgggctt ggtgtgttca actatgactt tggttctgtc 720
 accaaagaat ctccagttat taaggcagtc tatggcactc tttttgaagc tgaacacaga 780
 tccactttct acattccata ttggaaaatt ccattggcaa ggtggatagt cccaaggcaa 840
 agaaagtttc aggatgacct aaaggctatc aatacttgct ttgatggact tatcagaaat 900
 gcaaaagaga gcagacagga aacagatgtt gagaaattgc agcagagggga ttacttaaat 960
 ttgaaggatg caagtcttct gcgtttcctg gttgatatgc ggggagctga tgttgatgat 1020
 cgtcagttga gggatgattt aatgacaatg cttattgccg gtcatgaaac aacggctgca 1080
 gttcttactt gggcagtttt cctcctagct caaaatccta gcaaaatgaa gaaggctcaa 1140
 gcagaggtag atttgggtgct ggggtacgggg aggccaactt ttgaatcact taaggaattg 1200
 cagtacatta gattgattgt tgtggaggct cttcgtttat accccaacc acctttgctg 1260
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 tatgcaattc ctgctgggac tgatgtcttc atttctgtat ataatctcca tagatctcca 1380
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 gaagaaattg aaggatgggc tggctctgat ccactctgaa gtcccggagc cttgtatccg 1500
 aacgagggtta tatcggattt tgcattctta ctttttgggtg gcggaccacg aaaatgtggt 1560
 ggggaccaat ttgctctgat ggagtccact gtagcgttga ctatgctgct ccagaatttt 1620
 gacgtggaac taaaagggac ccctgaatcg gtggaactag ttactggggc aactattcat 1680
 accaaaaatg gaatgtggtg cagattgaag aagagatcta atttacgttg a 1731

<210> 56
 <211> 659
 <212> PRT
 <213> *Skeletonema costatum*

<400> 56

Met Ala Ser Tyr Glu Ser Asp Leu Leu Ser Thr Trp Asp Glu Asp Pro
 1 5 10 15

Ser Leu Gln Lys Gly Phe Asp Trp Glu Ile Glu Lys Leu Arg Arg Tyr
 20 25 30

Phe Ala Gly Leu Arg Gln Thr Pro Asp Gly Arg Trp Val Arg Lys Ser
 35 40 45

Thr Leu Phe Glu Phe Leu Val Thr Asn Ser Pro Ser Lys Val Val Gly
 50 55 60

Val Gly Pro Asp Gly Glu Arg Tyr Glu Ser Pro Pro Lys Pro Val Asn
 65 70 75 80

Ile Phe Asp Val Gly Val Leu Val Gly Lys Asn Thr Leu Thr Trp Leu
 85 90 95

Gly Phe Gly Pro Asn Leu Gly Met Ala Ala Val Pro Asp Ala Val Ile
 100 105 110

Gln Lys Tyr Glu Gly Ser Phe Phe Thr Phe Ile Lys Gly Ala Leu Gly
 115 120 125

Gly Asp Leu Gln Thr Leu Ala Gly Gly Pro Leu Phe Leu Leu Leu Ala
 130 135 140

Lys Tyr Tyr Thr Asp His Gly Pro Ile Phe Asn Leu Ser Phe Gly Pro
 145 150 155 160

Lys Ser Phe Leu Val Ile Ser Asp Pro Val Met Ala Arg His Ile Leu
 165 170 175

Arg Asp Ser Ser Pro Glu Gln Tyr Cys Lys Gly Met Leu Ala Glu Ile
 180 185 190

Leu Glu Pro Ile Met Gly Asp Gly Leu Ile Pro Ala Asp Pro Lys Ile
 195 200 205

Trp Lys Val Arg Arg Arg Ala Val Val Pro Gly Phe His Lys Lys Trp
 210 215 220

Leu Asn Ser Met Ile Gly Leu Phe Gly Asp Cys Gly Asp Arg Leu Val
 225 230 235 240

Asp Asp Leu Glu Lys Arg Ser Thr Ser Asp Lys Pro Val Ile Asp Met
 245 250 255

Glu Glu Arg Phe Cys Ser Val Thr Leu Asp Ile Ile Gly Lys Ala Val
 260 265 270

Phe Asn Tyr Asp Phe Gly Ser Val Thr Lys Glu Ser Pro Ile Val Lys
 275 280 285

Ala Val Tyr Arg Val Leu Arg Glu Ala Glu His Arg Ser Ser Ser Phe
 290 295 300

Ile Pro Tyr Trp Asn Leu Pro Tyr Ala Glu Lys Trp Met Val Gly Gln
 305 310 315 320

Val Glu Phe Arg Lys Asp Met Gly Met Leu Asp Asp Ile Leu Ala Lys
325 330 335

Leu Ile Asn Arg Ala Val Glu Thr Arg Gln Glu Ala Thr Val Glu Glu
340 345 350

Leu Glu Glu Arg Glu Thr Ser Asp Asp Pro Ser Leu Leu Arg Phe Leu
355 360 365

Val Asp Met Arg Gly Glu Asp Leu Thr Ser Lys Val Leu Arg Asp Asp
370 375 380

Leu Met Thr Met Leu Ile Ala Gly His Glu Thr Thr Ala Ala Met Leu
385 390 395 400

Thr Trp Thr Met Phe Gly Leu Val Ser Asn Asp Pro Gly Met Met Lys
405 410 415

Glu Ile Gln Ala Glu Val Arg Thr Val Met Gly Asn Lys Ser Arg Pro
420 425 430

Asp Tyr Asp Asp Val Val Ala Met Lys Lys Leu Arg Tyr Ala Leu Ile
435 440 445

Glu Ala Leu Arg Leu Tyr Pro Glu Pro Pro Val Leu Ile Arg Arg Ala
450 455 460

Arg Gln Glu Asp Thr Leu Pro Pro Gly Gly Thr Gly Leu Ser Gly Gly
465 470 475 480

Val Lys Val Leu Arg Gly Thr Asp Ile Phe Ile Ser Thr Trp Asn Leu
485 490 495

His Arg Ala Pro Glu Tyr Trp Glu Asn Ala Asp Lys Tyr Asp Pro Thr
500 505 510

Arg Trp Glu Arg Pro Phe Lys Asn Pro Gly Val Lys Gly Trp Asn Gly
515 520 525

Tyr Asp Pro Glu Lys Gln Ser Ser Gln Ser Leu Tyr Pro Asn Glu Ile
530 535 540

Thr Ser Asp Tyr Ala Phe Leu Pro Phe Gly Ala Gly Lys Arg Lys Cys
545 550 555 560

Ile Gly Asp Gln Phe Ala Met Leu Glu Ala Ser Val Thr Leu Ser Met
565 570 575

Ile Met Asn Lys Phe Asp Phe Thr Leu Val Gly Thr Pro Glu Asp Val
580 585 590

Gly Met Lys Thr Gly Ala Thr Ile His Thr Met Asn Gly Leu Asn Met
595 600 605

Met Val Ser Pro Arg Ser Glu Thr Asn Pro Ile Pro Gly Thr Asn Glu
610 615 620

Trp Trp Thr Lys Gln His Leu Met Arg Gly Leu Ser Ser Thr Gly Arg
625 630 635 640

Pro Tyr Thr Ser Asp Glu Asp Ala Ala Trp Thr Thr Ser Ala Asn Gly
645 650 655

Met Arg Pro

<210> 57
<211> 1980
<212> DNA
<213> *Skeletonema costatum*

<400> 57
atggcctcct acgagagtga tctgctctca acatgggatg aagatccatc gctgcaaaag 60
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gacgggcgat ggggtgcgcaa gtcgacactg tttgagtttc ttgtgacaaa ctctccaagt 180
aaagtagttg gggtaggtcc ggatggggaa cggtatgaaa gccctccgaa accagtcaat 240
atcttcgatg tgggagtgtt agtcggtaag aatacactca cttgggtggg atttggaccg 300
aatttgggta tggccgcggt acccgatgca gtcattcaaa agtatgaggg tagcttcttc 360
acctttatca agggagcatt ggggggtgat ttgcaaactt tggcgggtgg tcctttgttc 420
ttattgcttg ccaagtatta tacggatcat ggaccattt tcaacttgag ttttgacca 480
aagagctttt tgggtgatttc ggatcctgtt atggcgaggc atattttgag ggatagtcca 540
ccggagcagt attgtaaggg aatgcttgcg gagattttgg aaccgatcat gggatgatga 600
ttgattcctg cagatccaaa gatttggaag gttcgtcgaa gagctgtcgt acctggtttc 660
cacaaaaagt ggctgaacag catgattggg ttgttcggag actgtggtga tcgtctcgtt 720
gacgatctag aaaagcgttc tacttcagat aaacctgtaa ttgacatgga agaacgattc 780
tgttccgtca cactcgatat catcggttaag gcagtattca actatgattt tggatcagtg 840

acaaaggaat cacctattgt aaaggcagta tacagagtgt tacgtgaggc ggagcacaga	900
tcatcttcgt tcatccccta ctggaacttg ccttatgctg agaaatggat ggtaggacag	960
gttgaattcc gcaaagatat gggaatgctt gacgatatct tggcaaaact gatcaatcgt	1020
gctgttgaga ctaggcaaga agctactgtc gaagagttagg aagagagaga aacaagcgat	1080
gatccgagtc tcttaagggt cctagttgat atgaggggag aagatttaac gagtaaagtg	1140
ttgagagatg atttgatgac aatgcttatt gcaggacatg aaacaacagc ggcaatgctg	1200
acgtggacaa tgtttgggct agtaagcaac gatcctggca tgatgaagga aatccaggca	1260
gaagttcgaa ctgtcatggg caataagtct cgaccagatt acgatgatgt tgtggcgatg	1320
aaaaagttga ggtatgcttt gattgaagca cttcgattat atcccgagcc acccggtgtg	1380
attcgcaggg caaggcaaga ggacactctt ccaccagggtg gtacgggtct ttctggaggt	1440
gtcaaagtat tgcgtggaac agatatcttt atttctactt ggaaccttca ccgcgctcca	1500
gaatactggg agaatgcaga caaatatgac cctactcgat gggagcgtcc gttcaaaaac	1560
ccagggtgta agggttggaa tggatatgat ccggaaaaac aatcatctca atcactttat	1620
cctaacgaga taacgtcaga ctatgctttc cttccttttg gtgctgggaa gagaaaatgt	1680
atcggggatc agtttgctat gctcgaggct tcggttacac tatcgatgat tatgaataaa	1740
tttgacttca cgttggtcgg taccctgaa gatgtcggca tgaagaccgg agcaactatt	1800
cataccatga atgggctcaa catgatggtc agccctcgat cagagacaaa cccgattcca	1860
gggacaaatg agtgggtggac gaaacaacat ctaatgagag gtttgagttc tactggaaga	1920
ccatacactt ccgatgaaga tgccgcgtgg acgacatccg ctaatggcat gagaccgtga	1980

<210> 58

<400> 58
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<210> 59

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Synthetic

<400> 59

cacacacaca cacacaca

18

<210> 60
 <211> 77
 <212> PRT
 <213> Oryza sativa

<400> 60

Leu Glu Thr Ser Ala Leu Ser Gly Lys Pro Val Asn Met Glu Ala Arg
 1 5 10 15

Phe Ser Gln Met Thr Leu Asp Val Ile Gly Leu Ser Leu Phe Asn Tyr
 20 25 30

Asn Phe Asp Ser Leu Thr Ser Asp Ser Pro Val Ile Asp Ala Val Tyr
 35 40 45

Thr Ala Leu Lys Glu Ala Glu Leu Arg Ser Thr Asp Leu Leu Pro Tyr
 50 55 60

Trp Lys Ile Asp Leu Leu Cys Lys Ile Val Pro Arg Gln
 65 70 75

<210> 61
 <211> 77
 <212> PRT
 <213> Zea mays

<400> 61

Leu Glu Pro Tyr Ala Leu Ser Gly Glu Pro Val Asn Met Glu Ala Arg
 1 5 10 15

Phe Ser Gln Leu Thr Leu Asp Val Ile Gly Leu Ser Leu Phe Asn Tyr
 20 25 30

Asn Phe Asp Ser Leu Thr Thr Asp Ser Pro Val Ile Asp Ala Val Tyr
 35 40 45

Thr Ala Leu Lys Glu Ala Glu Leu Arg Ser Thr Asp Leu Leu Pro Tyr
 50 55 60

Trp Lys Val Gly Phe Leu Cys Lys Ile Ile Pro Arg Gln
 65 70 75

<210> 62
<211> 77
<212> PRT
<213> Hordeum vulgare

<400> 62

Leu Glu Thr Tyr Ala Leu Ser Gly Glu Pro Val Asn Met Glu Ala Arg
1 5 10 15

Phe Ser Gln Met Thr Leu Asp Val Ile Gly Leu Ser Leu Phe Asn Tyr
20 25 30

Asn Phe Asp Ser Leu Thr Ser Asp Ser Pro Val Ile Asp Ala Val Tyr
35 40 45

Thr Ala Leu Lys Glu Ala Glu Ala Arg Ser Thr Asp Leu Leu Pro Tyr
50 55 60

Trp Gln Ile Asp Leu Leu Cys Lys Ile Val Pro Arg Gln
65 70 75

<210> 63
<211> 77
<212> PRT
<213> Triticum aestivum

<400> 63

Leu Glu Thr Tyr Ala Leu Ser Gly Glu Pro Val Asn Met Glu Ala Arg
1 5 10 15

Phe Ser Gln Met Thr Leu Asp Val Ile Gly Leu Ser Leu Phe Asn Tyr
20 25 30

Asn Phe Asp Ser Leu Thr Ser Asp Ser Pro Val Ile Asp Ala Val Tyr
35 40 45

Thr Ala Leu Lys Glu Ala Glu Ala Arg Ser Thr Asp Leu Leu Pro Tyr
50 55 60

Trp Gln Ile Asp Leu Leu Cys Lys Ile Val Pro Arg Gln
65 70 75

<210> 64
 <211> 77
 <212> PRT
 <213> Arabidopsis thaliana

<400> 64

Leu Gln Pro Tyr Ala Glu Asp Gly Ser Ala Val Asn Met Glu Ala Lys
 1 5 10 15

Phe Ser Gln Met Thr Leu Asp Val Ile Gly Leu Ser Leu Phe Asn Tyr
 20 25 30

Asn Phe Asp Ser Leu Thr Thr Asp Ser Pro Val Ile Glu Ala Val Tyr
 35 40 45

Thr Ala Leu Lys Glu Ala Glu Leu Arg Ser Thr Asp Leu Leu Pro Tyr
 50 55 60

Trp Lys Ile Asp Ala Leu Cys Lys Ile Val Pro Arg Gln
 65 70 75

<210> 65
 <211> 77
 <212> PRT
 <213> Helianthus annuus

<400> 65

Leu Arg Ser Tyr Ala Arg Ser Asp Thr Ser Val Asn Met Glu Gln Gln
 1 5 10 15

Phe Ser Gln Leu Thr Leu Asp Val Ile Gly Leu Ala Val Phe Asn Tyr
 20 25 30

Asn Phe Asp Ser Leu Thr Ala Asp Ser Pro Val Ile Glu Ser Val Tyr
 35 40 45

Thr Ala Leu Lys Glu Ala Glu Ala Arg Ser Thr Asp Leu Leu Pro Tyr
 50 55 60

Trp Lys Ile Ser Ala Leu Cys Lys Ile Ile Pro Arg Gln
 65 70 75

<210> 66
 <211> 77
 <212> PRT
 <213> Lycopersicon esculentum

<400> 66

Leu Leu Pro Asp Ala Ile Ser Gly Ser Ala Val Asn Met Glu Ala Lys
 1 5 10 15

Phe Ser Gln Leu Thr Leu Asp Val Ile Gly Leu Ala Leu Phe Asn Tyr
 20 25 30

Asn Phe Asp Ser Leu Thr Thr Asp Ser Pro Val Ile Asp Ala Val Tyr
 35 40 45

Thr Ala Leu Lys Glu Ala Glu Leu Arg Ser Thr Asp Leu Leu Pro Tyr
 50 55 60

Trp Gln Ile Lys Ala Leu Cys Lys Phe Ile Pro Arg Gln
 65 70 75

<210> 67
 <211> 77
 <212> PRT
 <213> Hordeum vulgare

<400> 67

Leu Asp Lys Ala Ala Ser Asp Gly Glu Asp Val Glu Met Glu Ser Leu
 1 5 10 15

Phe Ser Arg Leu Thr Leu Asp Val Ile Gly Lys Ala Val Phe Asn Tyr
 20 25 30

Asp Phe Asp Ser Leu Ser Tyr Asp Asn Gly Ile Val Glu Ala Val Tyr
 35 40 45

Val Thr Leu Arg Glu Ala Glu Met Arg Ser Thr Ser Pro Ile Pro Thr
 50 55 60

Trp Glu Ile Pro Ile Trp Lys Asp Ile Ser Pro Arg Gln
 65 70 75

<210> 68
 <211> 77
 <212> PRT
 <213> Triticum aestivum

<400> 68

Leu Asp Lys Ala Ala Ser Asp Gly Glu Asp Val Glu Met Glu Ser Leu
 1 5 10 15

Phe Ser Arg Leu Thr Leu Asp Val Ile Gly Lys Ala Val Phe Asn Tyr
 20 25 30

Asp Phe Asp Ser Leu Ser Tyr Asp Asn Gly Ile Val Glu Ala Val Tyr
 35 40 45

Val Thr Leu Arg Glu Ala Glu Met Arg Ser Thr Ser Pro Ile Pro Thr
 50 55 60

Trp Glu Ile Pro Ile Trp Lys Asp Ile Ser Pro Arg Gln
 65 70 75

<210> 69
 <211> 77
 <212> PRT
 <213> Oryza sativa

<400> 69

Leu Asp Lys Ala Ala Thr Asp Gly Glu Asp Val Glu Met Glu Ser Leu
 1 5 10 15

Phe Ser Arg Leu Thr Leu Asp Val Ile Gly Lys Ala Val Phe Asn Tyr
 20 25 30

Asp Phe Asp Ser Leu Ser Tyr Asp Asn Gly Ile Val Glu Ala Val Tyr
 35 40 45

Val Thr Leu Arg Glu Ala Glu Met Arg Ser Thr Ser Pro Ile Pro Thr
 50 55 60

Trp Glu Ile Pro Ile Trp Lys Asp Ile Ser Pro Arg Gln
 65 70 75

<210> 70
 <211> 77
 <212> PRT
 <213> Glycine max

<400> 70

Leu Asp Ala Ala Ala Ser Asp Gly Glu Asp Val Glu Met Glu Ser Leu
 1 5 10 15

Phe Ser Arg Leu Thr Leu Asp Ile Ile Gly Lys Ala Val Phe Asn Tyr
 20 25 30

Asp Phe Asp Ser Leu Ser Asn Asp Thr Gly Ile Val Glu Ala Val Tyr
 35 40 45

Thr Val Leu Arg Glu Ala Glu Asp Arg Ser Val Ala Pro Ile Pro Val
 50 55 60

Trp Glu Ile Pro Ile Trp Lys Asp Ile Ser Pro Arg Leu
 65 70 75

<210> 71
 <211> 77
 <212> PRT
 <213> Lycopersicon esculentum

<400> 71

Leu Asp Val Ala Ala Thr Asp Gly Glu Asp Val Glu Met Glu Ser Leu
 1 5 10 15

Phe Ser Arg Leu Thr Leu Asp Ile Ile Gly Lys Ala Val Phe Asn Tyr
 20 25 30

Asp Phe Asp Ser Leu Thr Val Asp Thr Gly Ile Val Glu Ala Val Tyr
 35 40 45

Thr Val Leu Arg Glu Ala Glu Asp Arg Ser Val Ala Pro Ile Pro Val
 50 55 60

Trp Glu Leu Pro Ile Trp Lys Asp Ile Ser Pro Lys Leu
 65 70 75

<210> 72
 <211> 77
 <212> PRT
 <213> Arabidopsis thaliana

<400> 72

Leu Asp Ala Ala Ala Leu Lys Gly Glu Glu Val Glu Met Glu Ser Leu
 1 5 10 15

Phe Ser Arg Leu Thr Leu Asp Ile Ile Gly Lys Ala Val Phe Asn Tyr
 20 25 30

Asp Phe Asp Ser Leu Thr Asn Asp Thr Gly Val Ile Glu Ala Val Tyr
 35 40 45

Thr Val Leu Arg Glu Ala Glu Asp Arg Ser Val Ser Pro Ile Pro Val
 50 55 60

Trp Asp Ile Pro Ile Trp Lys Asp Ile Ser Pro Arg Gln
 65 70 75

<210> 73
 <211> 77
 <212> PRT
 <213> Chlamydomonas reinhardtii

<400> 73

Leu Asp Lys Tyr Ala Ala Ser Gly Thr Ser Leu Asp Met Glu Asn Phe
 1 5 10 15

Phe Ser Arg Leu Gly Leu Asp Ile Ile Gly Lys Ala Val Phe Asn Tyr
 20 25 30

Asp Phe Asp Ser Leu Ala His Asp Asp Pro Val Ile Gln Ala Val Tyr
 35 40 45

Thr Leu Leu Arg Glu Ala Glu His Arg Ser Thr Ala Pro Ile Ala Tyr
 50 55 60

Trp Asn Ile Pro Gly Ile Gln Phe Val Val Pro Arg Gln
 65 70 75

<210> 74
<211> 85
<212> PRT
<213> Arabidopsis thaliana

<400> 74

Glu Lys Leu Ile Arg Glu Lys Glu Thr Ser Ser Gly Glu Asp Thr Ile
1 5 10 15

Glu Leu Asp Leu Glu Ala Glu Phe Ser Ser Leu Ala Leu Asp Ile Ile
20 25 30

Gly Leu Ser Val Phe Asn Tyr Asp Phe Gly Ser Val Thr Lys Glu Ser
35 40 45

Pro Val Ile Lys Ala Val Tyr Gly Thr Leu Phe Glu Ala Glu His Arg
50 55 60

Ser Thr Phe Tyr Phe Pro Tyr Trp Asn Phe Pro Pro Ala Arg Trp Ile
65 70 75 80

Val Pro Arg Gln Arg
85